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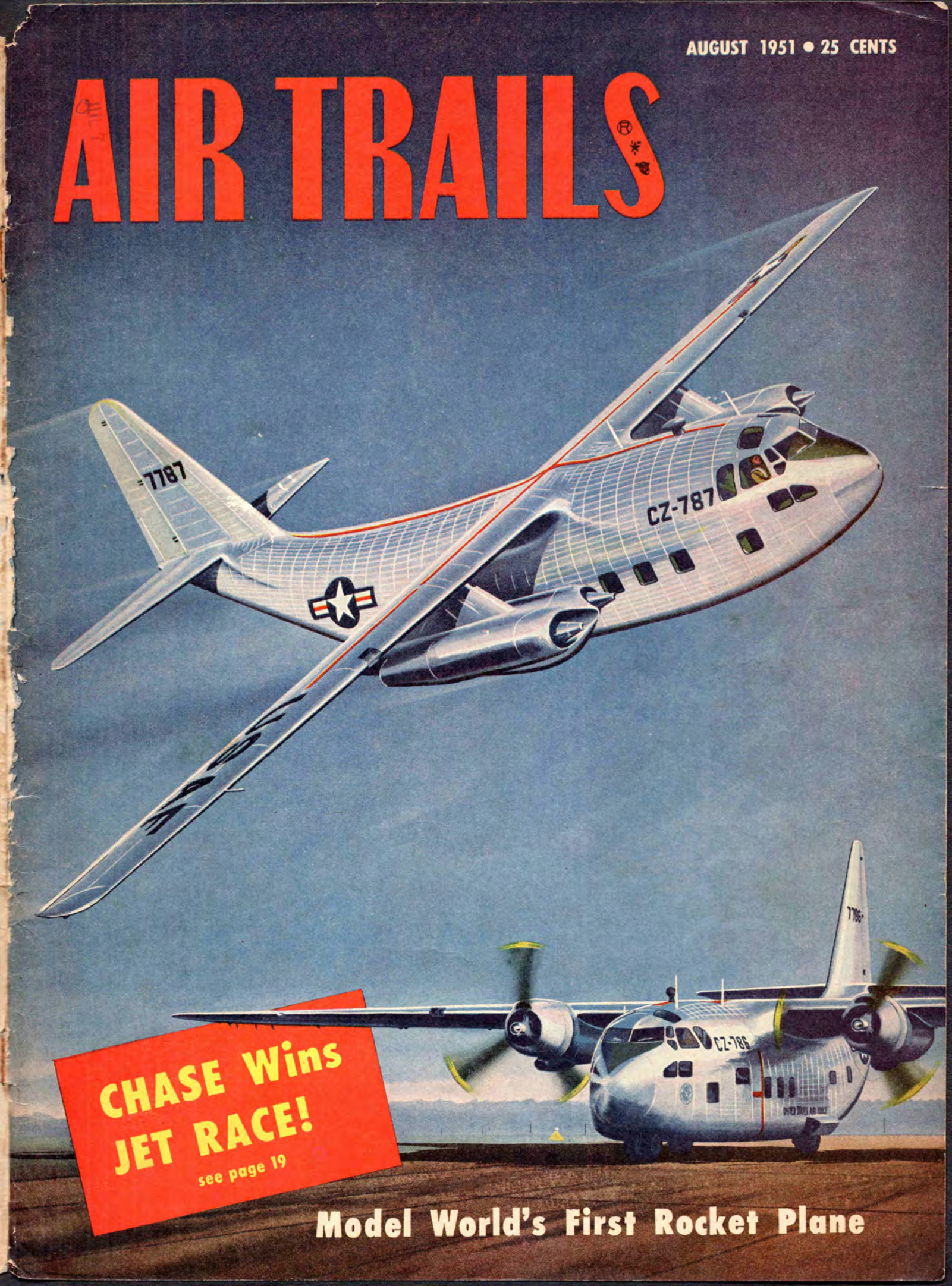

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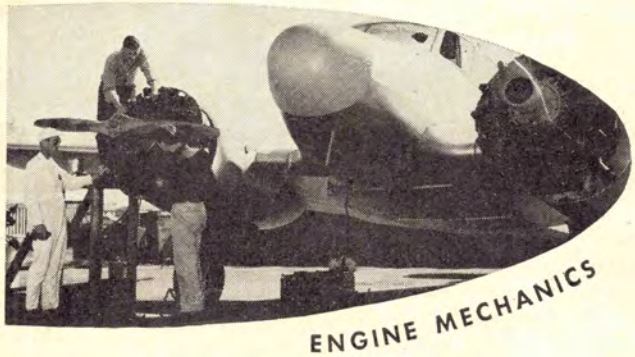

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Aug., 1951 AIR TRAILS The Leading Magazine of Air Progress and Aeromodeling

THE READERS WRITE:

All Communications to the Air Trails editorial offices should be addressed to Air Trails, 304 E. 45th. St., New York 17, N. Y.

The First Turbo-Prop Plane . . . In Andrew R. Boone's article "Here Come the Turbo-Props," he makes the amazing statement that the Convair XP5Y-1 was the first turbo-prop airplane in the world to take wing. Surely one of you people knows enough history to have corrected him. In England on March 24, *1948*, the prototype Boulton Paul Balliol trainer powered with an A.S. Mamba prop-set made its first test flight—some time before the XP5Y-1, I should think!

Graham E. Martin, Bristol, England

● Sorry, cousin. It was certainly not our intention to depreciate the efforts of others in connection with the development of turbo-prop aircraft. The author was discussing the American effort; the U. S. designation was dropped inadvertantly.

Clipper Chisai Time . . . In the article accompanying the plans for a slick loading PAA-Load model called Clipper Chisai, it gave its times, and I quote: "With 15 secs. engine run, R.O.G., payload abroad, the total endurance clocked in at about 75 secs. for half a dozen consecutive flights."

In my opinion this is lousy time. Didn't Frank Ehling hit 13 mins. to take first place at the 1950 Nationals?

Charles Sherman, St. Olaf College, Northfield, Minn.

● Practically in the same mail we received this letter from Japan from another Sherman—the Clipper Chisai's designer and father of Pan American's PAA-Load Event:

Once again I am indebted to you for a generous and artistic presentation in Air Trails. This time, of course, I refer to the beautiful treatment you gave *Clipper Chisai* in the May, 1951 issue. I am particularly impressed and gratified by the extremely fine work of your artist(s) in preparing the cutaway perspective. Having done some less complicated work of this sort, I appreciate keenly the effort and patience required. I hope you will do me the favor of passing on my sincere appreciation.

Should you be harboring any reservations that *Clipper Chisai* won't hold her own in competition, I think I can put your mind at ease by stating that her biggest need at the moment is a dethermalizer. Must confess I had believed in the past that the PAA-LOAD Occupant would act as sufficient dethermalizer. I still believe this is O.K. in principle, but the size and weight of the Occupant should be increased if we are to be certain the principle will work well enough to bring the model down during good flight atmosphere conditions. (I'm *not* proposing to change the rules now!) Anyway, on account of the conditions were good last Saturday, and *Clipper Chisai* had a new Wasp .049 strapped on her nose, and she got hand-launched in a gusty wind, and said Wasp whined 25 seconds instead of 20: *Chisai* flew O.O.S. in about 10 minutes and spent the weekend in the woods! Further, on account of there was a rainstorm all night and *Chisai* was fully exposed in a treetop, when she was finally retrieved, her frame was warped, her skin ripped and her finish ruined. The good Iwata brothers have undertaken her hospitalization and will doctor her up to same as new except—at my request—they are replacing her beautiful PAA silver and blue finish with an all-over coat of visibility orange color!

In case you're interested in how performance was improved (using for reference the drawings on page 50 of the May issue), here's how:

1. The nose is cut off at F3; a 1/8" sheet balsa bulkhead installed there, to the front of which is glued the maximum size possible flat-bottomed U-shaped frame of 1/8" sq. balsa. This frame acts as a "home" for the plywood firewall engine mounting.

2. A 1/8" sheet plywood firewall is cut rectangular shape (to fit into the U-shaped "home") except rounded at top to conform to shape of upper nose cowling. Wasp .049 engine is mounted on this firewall as high as possible. Wire hooks are secured to engine by main engine assembly bolts. 5 1/2" diameter x 3" pitch propeller is used.

3. A 1/8" hardwood dowel is installed through the fuselage just below crutch at position F5. Rubber bands from ends of this dowel attach engine and firewall by gripping wire engine hooks. This allows easy and immediate thrust line adjustments by inserting spacers behind firewall.

4. Wheels are replaced by lighter ones of smaller frontal area but same diameter.

5. The 1/8" sheet floor is moved from between F6 and F7 to between F5 and F6. The Occupant is moved forward until his front is at F5. (With the Occupant's place here, don't try to fly without him!)

6. A 3/32" x 1/2" sheet is placed flat under leading edge of stabilizer back of F19.

Probable reasons for increased performance are:

a. *More power.* b. *Power more efficiently applied;* raised thrust line requires less downthrust. c. *Sharper turn;* due to shorter nose moment arm and less lateral area in front of C. G. d. *Less resistance;* due to decreased frontal area of wheels and decreased angular difference between wing and stabilizer. e. *Lighter weight;* weight saved by lightening nose and wheels.

. . . So much for *Clipper Chisai* to the moment. But, since you know that fine models are usually developments rather than original inspirations, I warn you that I believe *Chisai* is worthy of further development and that you may hear more from her!

Dallas B. Sherman

One Astrodome Missing . . . Congratulations to you and Douglas Rolfe on the cutaway of the B-50D. Having worked on B-17s, B-29s and B-50A's while in the Air Force, I was very much interested in this article. I had only one fault to find. I believe your top view of the XB-29 is wrong. As I remember, the astrodome on the XB-29 was teardrop shape and located directly aft of the top pilot's windows. Am I right?

Bud Everett, Haddonfield, N. J.

●You are. The XB-29's astrodome had a teardrop shape and was mounted directly behind and above the pilot compartment. It "vanished" in the process of printing the black silhouette.

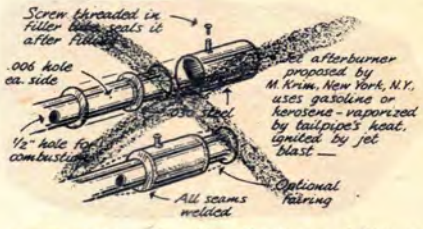
Altitude Record . . . I had an argument with my science teacher about what airplane had reached the highest altitude. Will you please settle that argument by naming it?

Harry Burkizen, Jersey City, N. J.

● Present altitude record for airplanes is 59,425 ft. held by British pilot John Cunningham. It was established in March 1948 with a deHavilland Vampire fighter.

Don't Alter a Jet . . . According to everything I've read, a model jet engine is a carefully tuned "pipe" and any alterations are out of order, in fact, will probably ruin same. I refer to your June "Sketchbook."

Peter Franklin, New York City



● AT agrees. No alterations or additions should be made to any model jet engine.

Miss Quito Buzzes Prairie . . . In your December edition I found two AA planes which I built and flew over the winter months. Miss Quito has made well over 75 successful flights and is still as good as new. Its longest flight was about one mile distance. It is almost impossible to fly out of sight here in Saskatchewan. The other plane I made was Hi-Pressure Pete which I have not had the opportunity to try yet because of the snow.

Frank Palfy, Plunkett, Sask., Can.

Speed and Bubble/Flush Canopies . . . Which was faster, the model Republic P-47 with the bubble canopy or the flush canopy? What about the F-51 with bubble or flush canopy? And what happened to the Grumman lightplane, the Kitten? I saw a picture of it once and I've never heard of it since.

David Kingman, Merrick, N. Y.

● Sorry, we cannot give you a positive answer as to speed difference between flush and bubble canopies. Perhaps some of our readers who have flown both can give us their opinions, which we will be glad to publish.

The Kitten was an experimental attempt by the Grumman Aircraft Engineering Company to get into the light personal aircraft field. They abandoned the idea long ago.

(*Continued on page 9*)

17 18

THE DRAFT

(AGE 18—
WRITE FOR INFORMATION)

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BURIED IN THIS AD

are most of the new items. Sometimes there isn't time or space to include them. But, if available, we have it.

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Super Squirt 21" (Jet)	5.95
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Wee Willie 18" AA-A	1.95
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Wildfire 23" B-C-D	1.95
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Wing Dingus 16" AA	2.25
Yank 23" AA	1.95
Zing 24" C-D	4.95

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	Pts	Qts
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Ohlsson #1, #3	.85	1.60
Brewer Mist #6	.65	—
For Glo		
Ohlsson #2, #4	.85	1.60
Ohlsson AA	.85	—
Powermist Glo	.95	—
Powermist Spitfire	—	1.60
Ranger Glo	.90	—
Testors 39	.75	—
Dynaglo	.85	—
Ranger AA	.90	—
Blue Blazer #1	.70	—
Blue Blazer #2	.80	—
Ranger & Infant	.90	—
OK Cub	.85	—
Spitzy	.85	—
Supersonic 100	.89	—
Supersonic 1000	1.00	—
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Super Clown 38" B-C	2.96
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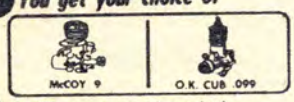

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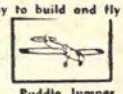

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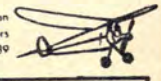

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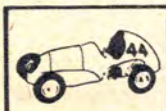

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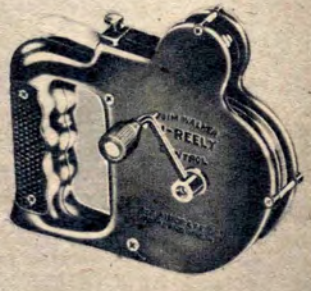

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The Readers Write

(*Continued from page 4*)

Handicaps in Speed . . . We are staging a contest and it is necessary that we cut down on the number of prizes to be given and have decided that if we had a scale for giving handicaps to smaller motors in speed we could get by with a Junior and Senior division in speed with three prizes to each group. Can you give me a scale by which any size engines can compete fairly?

Lynn H. Bilyeu, Chadron, Nebr.

• Anybody got any good suggestions on the subject?

Passenger Jets . . . Please furnish me with any information on jet passenger planes. How fast they go, what is their range, climb per minute, and the dimensions.

Donald Crigger, Parkersburg, W. Va.

• There are only two jet-propelled passenger planes flying at the present time. The Canadian Avro C 102, still in the experimental stage, has a wingspan of 98 ft. 1 in., length of 82 ft. 9 in., is powered by four Rolls-Royce Derwent jet engines of 3500 lbs. thrust each; performance data not available. The other plane is the British de-Havilland Comet, now in production. It can carry up to 48 passengers, has wingspan of 115 ft., length of 93 ft.; cruises at 490 mph and has a range, in still air, of 3500 miles.

Full-Size Plan Library . . . Our newly installed plan library of full-size plans is very successful. We rent the plans for 10c a month to any member of the club. If the plans become misused, torn or damaged in any way we fine 25c per plan damaged. It's a good idea for other smaller clubs.

Oregon Sky Wolves, McMinnville, Ore.

Money! . . . Air Trails is holding checks for the following who no longer are at the addresses given: Douglas Kimura, 857 Addison Ave., Chicago 13, Ill.; Warren Pollington, 3905 W. Imperial, Inglewood, Calif.

Can anyone supply us with their present addresses?

A. of V. is Open to All . . . I read your article "Russia: Colossus of the Air." I am only 11 years old but I am trying to learn all I can about aircraft and I want to say that story sure does deserve complimenting.

I would like to know if a minor may enter your Airmen of Vision contest and if a second entry could be made.

Robert Dorr, Silverhill, Md.

• The answer to both questions is yes.

Italy's First Jet . . . You published a picture with plan and data of Italy's first jet plane. I'd like to ask you, wasn't Caproni-Campini C.C.2 Italy's first jet plane?

Algird Sciuka, New Britain, Conn.

• If you read the caption carefully you will note it states "Italy's first *postwar* jet plane." The Caproni-Campini jet plane was built in 1939 and made its first flight in August 1941.

Questions on Color . . . I am building a scale P-51 Mustang and would like to know some of the colors the plane was painted during World War II.

Dean Stagle, Billings, Mont.

• Up to January 1944 all military planes were painted an olive drab. After that date they were no longer painted but left with their natural aluminum finish, with the exception of some transports.

. . . I received your plans for the F-82 twin Mustang. The pictures I have seen look like these planes were painted black and some silver with a black cowl. I am not sure they were the colors but would like to know what the color of yours is.

• All F-82s in service as night fighters were painted a dull black. Others retained their natural aluminum finish.

Showcase

Try your favorite hobby shop for items presented here. Write the manufacturer if you can't find it.

Prefabrication hits the towline glider field with Enterprise Model Aircraft & Supply Co's *Towline Terror*, featuring an elliptical wing with elliptical dihedral and the high-lift "Ritz" airfoil. Kit sells for $1. Fuselage has a double keel with "circlimatic" construction . . . Did you know that Herkimer Tool & Model Works has a Cub flywheel for use in model cars and boats? Fits the .039, .049 and .074 Cubs; has integral spin starting groove and is plated against corrosion. It weighs 1.5 oz. and has a diameter of $1\frac{3}{32}$ in., a width of $\frac{5}{8}$ in. . . . A full line of model gas tanks is offered by Engineered Toys in its *Rite-Pitch* selection. Twenty-three sizes are available. These tanks are made from tin-coated steel with thin walled copper vents, fillers and feeds. Priced at 60¢ each. . . . Consolidated Model Engineering Co. has a nifty idea: "first name" decal transfers so you can name your model after friends or members of your family. Consolidated offers about 150 boys' names (from Al to Willie) and an equal number of girls' names (from Adele to Vivian). You get six of the name decals in the form of small pennants for 25¢. . . . One of the most unusual scale kits to make its appearance in the model field is Testor's new $1.50 Vickers-Supermarine Spitfire (MK-19 version) because of the remarkable molded-to-shape fuselage and wing. The model has a wing span of 17½ inches and an overall length of 16 inches. All parts in the kit are shaped and ready for assembling. Key-Lock assembly is utilized; it employs die-cut formers which fit securely into place in the keel section with the simple slot-slide action of a key turning in a lock. Testor says this technique insures positive location and correct alignment of parts, saves building time, gives model greater rigidity. (*Continued on page* 16)

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air notes | AVIATION TODAY AND TOMORROW

TARZON super bomb (27 ft., 12,000 lbs.) has been used in Korea since last August; blown bridge girders 150 ft. in air. . . . SAVAGE is official name for North American AJ-1, Navy's heaviest carrier-based bomber powered by 2 piston engines plus jet in tail. . . . NATIONAL AIR RACES set for August 18 & 19 at Detroit; limited Air Force & Navy participation expected. . . . Caro Bayley's 30,203 ft. altitude record in 125 hp Super Cub okayed as official international mark by FAI. . . . AIR FORCE FLAG approved is dark blue, has eagle with outstretched wings above white & sky-blue shield (the AF seal); inset at top of shield is gold thunderbolt & shaft of lightning; shield is encircled by 13 stars.

★ ★ ★

BELL AIRCRAFT to build $3 million plant at Fort Worth for manufacture of helicopters. . . . ICAO wants all seats in passenger aircraft to withstand 9 G's; present regulations call for 6 G's. . . . KAISER-FRAZER's aircraft division (Oakland, Calif.) awarded contract for components of Lockheed P2V, Navy anti-sub patrol plane. . . . TF-51 is 2-place advanced training version of F-51 Mustang with enlarged cockpit for student & instructor in tandem. Texas Eng. & Mfg. Co., Dallas, is making the conversions. . . .

★ ★ ★

BRAZIL JET AIRLINER good possibility with Panair do Brazil line operating deHavilland Comets by '54 on transatlantic routes. This will be Series II Comet with more powerful Rolls-Royce Avon engines; payload of 14,000 lbs.; will seat 48 passengers. . . . SHIPS IN CONVOY expected to carry own helicopters for defense against submarines in event of war. English trials with Westland-Sikorsky S-51 operating from small flight deck atop supply ships may free carriers from merchant ship escort duties. . . . FOREIGN INVASION: deHavilland Dove & Percival Prince, twin-engine light British transports, demonstrating their abilities in U.S. as possible feeder line & executive planes. . . .

★ ★ ★

NON-STOP RECORD for lightplanes from Los Angeles to New York City set by Max Conrad in Piper Pacer: 2,460 miles in 23 hrs., 27 min. Conrad flew same ship to Switzerland last year. . . . WING TIP FLEX of Boeing B-47 six-jet bomber is 20 ft. Pilots see wing tips & outboard nacelles taking bumps while cockpit rides smoothly.

★ ★ ★

TB-50D flying schoolhouse version of B-50; used to train students in navigation, visual & radar bombing. Graduates assigned as navigator-bombardier-radar operators on 600 mph B-47. . . . NAVY'S CONSTITUTIONS, two huge Lockheed transports, have chalked up combined total of 3,000 hrs. flying. Double deck, 180 passenger transports fly high priority cargo from D.C. to Calif., from Calif. to Hawaii. . . . EL AL ISRAEL National Airlines inaugurated mail & cargo service NYC to Israel. . . . WORLD'S FASTEST GAL is Mme. Jacqueline Auriol of France who flew French-built Vampire jet fighter at 509 mph average over 100 kilometer course.

★ ★ ★

ENEMY PLANES destroyed over Korea included 147 MiG-15s out of first 314 Commies knocked out of action. For same period USAF's Far East Air Force lost 220 of all types; only 11 of these were brought down by Red fighters. . . . TANDEM-TYPE landing gear by Fairchild gives wider "footprint" to C-119; increases usefulness of Packet permitting big plane to land on unprepared fields with rough sod or soft surface.

★ ★ ★

EARTH SATELLITE ROCKET can be expected in 10-15 years, says Martin's chief engineer William B. Bergen. Speed of more than 16,000 mph will send it outside earth's atmosphere, enable it to establish itself in earth's orbit. Purpose: carry H-bomb over distant target in matter of minutes. . . . PLYMOUTH car outfit building hulls for Grumman SA-16 Albatross air-sea rescue amphib. . . . DOUGLAS has orders for 103 DC-6B's from 21 domestic & foreign airlines. . . . DEHAVILLAND has orders for 23 jet Comet 'liners; French Compagnie Maritime des Chargeurs Reunis airline ordered two Series I jobs powered by Ghost engines.

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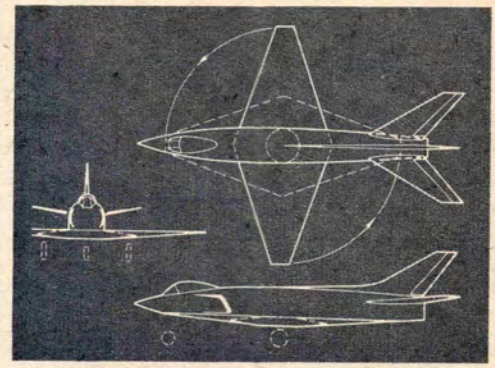
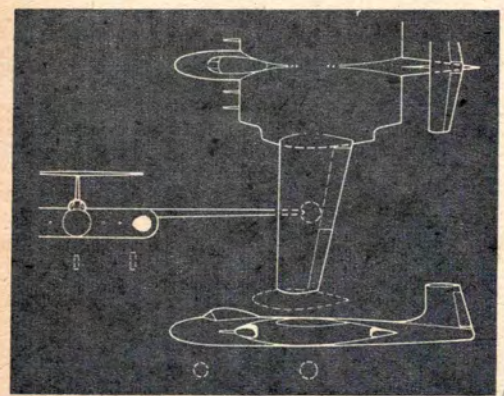
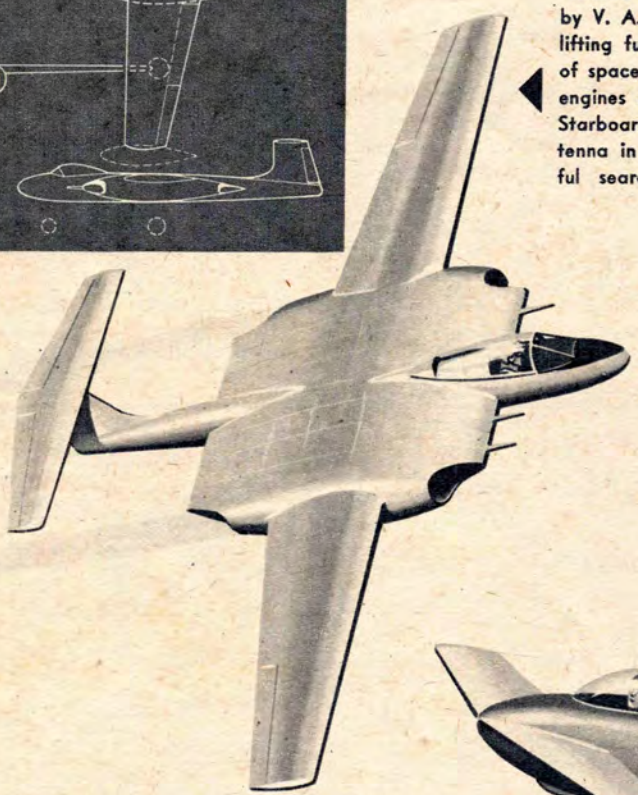
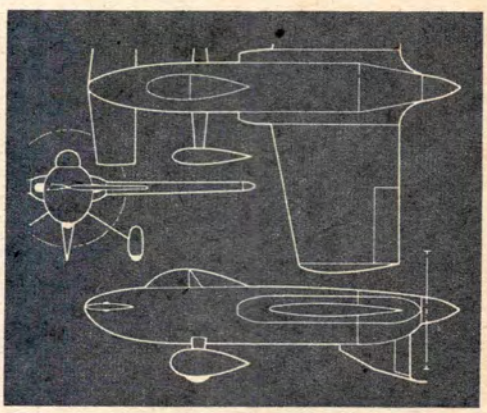


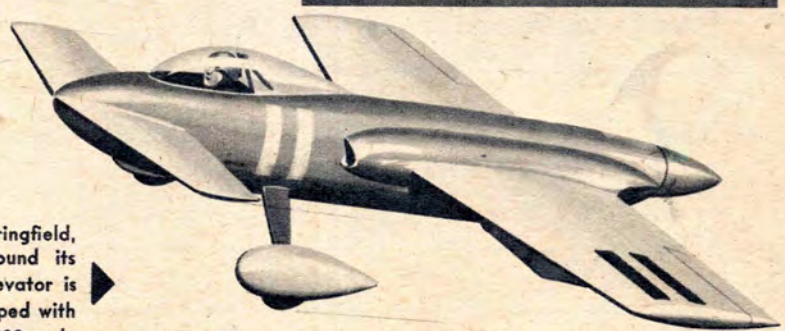
To J. J. Szakacs of San Diego, Calif., go this month's honors for design of a variable wing area aircraft. By rotating wing, area is considerably reduced as well as span and a sweep angle of 65° achieved, suitable for supersonic flight in 2000 mph region. With wing in high-speed trim, roll is accomplished by use of elevons of horizontal tail, which has large surface area. Span 35 to 16 ft.



"Manta" (Devil Fish), an attack bomber by V. A. Davis of Portsmouth, Va., uses lifting fuselage idea which gives plenty of space for the two 5000 lb. thrust jet engines and the self-sealing fuel tanks. Starboard wing tip carries radar antenna in streamlined housing. A powerful searchlight is on port wing tip.







A 190 cu. in. canard midget racer by John S. Moore of Springfield, Mo. Elevator has no stabilizer, entire unit rotating around its longtitudinal axis. Not too good an idea as such type elevator is apt to be oversensitive and devoid of feel. Should be equipped with anti-servo tabs. Span 15 ft., length 15 ft. Estimated speed 200 mph.

Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and Judges. The designs may be of any type: commercial aircraft, military planes (fighters) bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payments of $5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.

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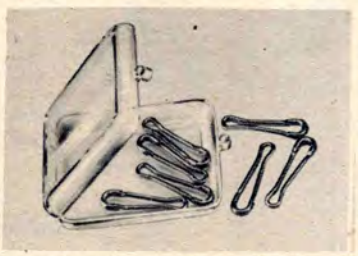
Showcase

Contact your hobby shop for items shown. All information is checked carefully, but is subject to change.

A 10¢ jar of hot fuel proofer, an ample amount to cover a Half-A model, is now offered by Comet Model Hobbyart for 10¢; this is in addition to the company's larger 25¢ size. Comet cement in 10¢ tubes and dopes in 10¢ jars are companion products. . . . Champion Boats (Box 9038, Dept. 43-G, Long Beach, Calif.) has a 25¢ catalog of its big-size racing boats ranging from 6 to 20 feet for which plans are available. . . . That gives us a lead-in to Berkeley's *Sea-Bird*, which is 24 inches long and takes motors from .23 to .49 cu. in. displacement for powering. The hull kit for this Class E hydroplane costs $4.95 and includes a mahogany die-cut planked hull. The hardware kit is $2.95 and consists of all the necessary parts such as the prop, stuffing box, engine coupling, strut, shafting, shaft collar, motor mounts, running plates and complete brass screws and nuts. Berkeley's other boats include the *Sea-Jet* for Jetex "50" power ($1.95 with the motor) and the Chris-Craft *Riviera Runabout*, a $2.95 deal for engines under .09. . . . We're sure glad to see Richard Smith Corp. (217 Centre St., New York 13, N. Y.) talking about its "T" shirts; goodness knows we get enough inquiries asking where such items can be obtained. The outfit says they have 'em for $8.50 per dozen which includes your club's name and emblem. . . .



A new connector for control-line flying comes from Sullivan Products, makers of Pylon Brand wire and accessories. The new Pylon Brand clips are stronger than previous ones although they are smaller in size and lighter in weight. Featuring a self-locking grip, the clips come in a hinged plastic box. They are packed 12 to a box in A, B or C size. They sell for 75¢ a dozen, or two for 15¢.

(Other Showcase items will be found on page 10.)

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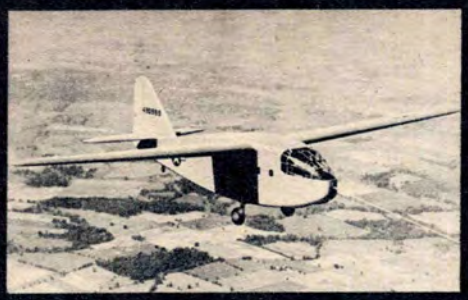
This latest "powered glider" by Chase, 100% jet, can take off and land in 600 feet!

With a complete lack of fanfare, an approach quite different from the current way of presenting new planes, Chase Aircraft of West Trenton, N. J. has put the first all-jet-powered assault transport into the air. This epochal achievement brings new honors to Michael Stroukoff, Chase's chief engineer and one of the most unorthodox figures in the U.S. aviation industry. The XC-123A all-jet transport is the revamped Chase XG-20 cargo glider powered by four Allison J-47 jet engines paired in pod type nacelles for a total of 20,800 pounds of thrust. The remarkable aircraft can take off and land in 600 feet—less space than required by a jet fighter! Some trick for a transport that grew up from a glider!

Principal Chase designs showing evolution from gliders to present assault transport



Twenty-three-place YCG-14A glider with metal fuselage, wood covering. Flew in '45.

All-metal YG-18A glider capable of carrying thirty. Flown in '47. Span 86 ft. 4 in.

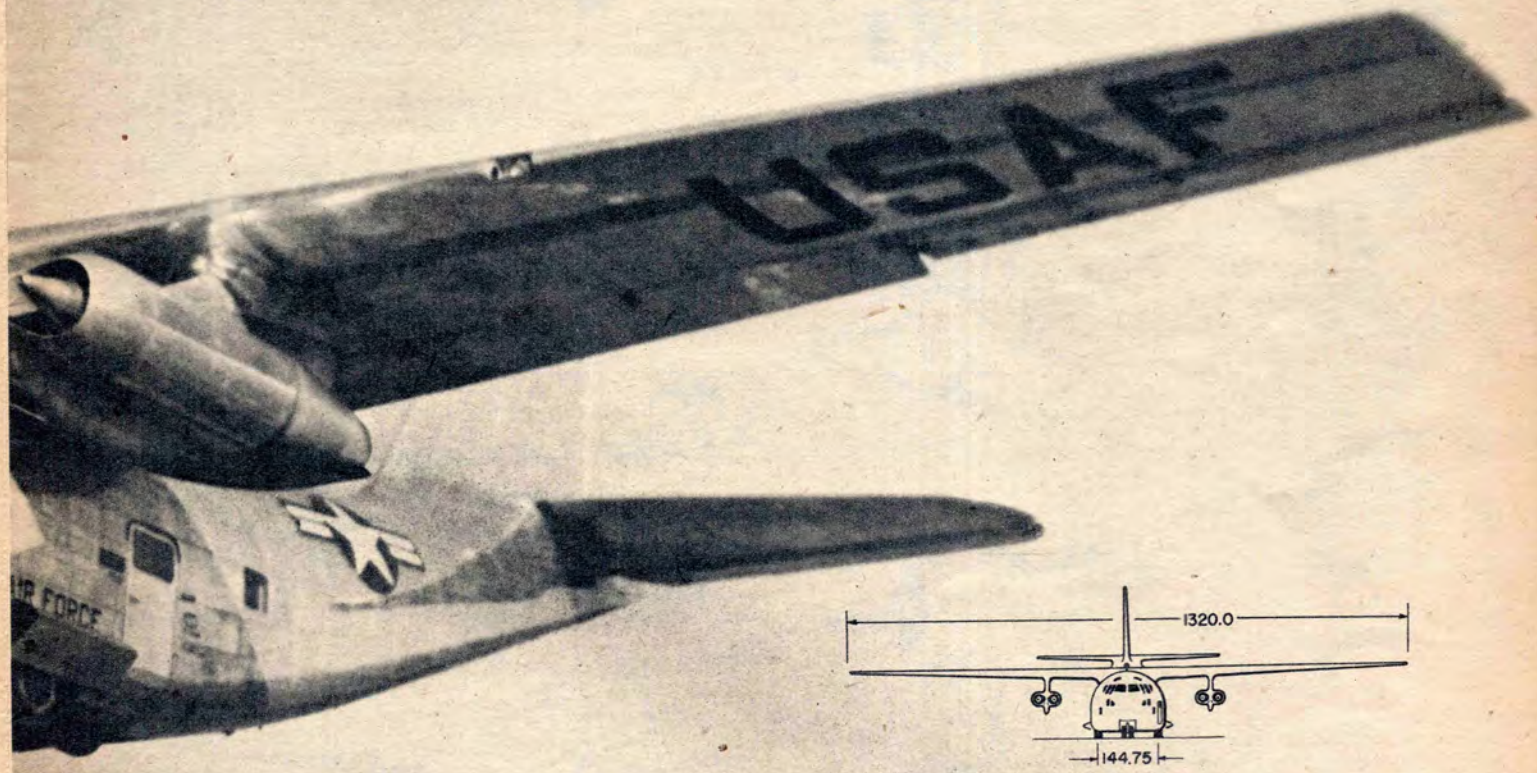
What stands out most at first sight of the XC-123A and other Chase planes is the long, narrow, high aspect ratio wings—an uncommon feature in aircraft whose task is to act as aerial trucks. Within these wings lies the performance formula of all Stroukoff planes: ability to get in and out of very small fields, and high speed in the air. Stroukoff did not leaf through the NACA volumes to select a proper airfoil for his planes—he designed it himself. A versatile and brilliant engineer and architect who built bridges, railroads and theaters, he applied his knoweldge of hydrodynamics to the problem of obtaining the highest possible efficiency out on a wing.

The result has been notably successful. Chase planes can hop in and out of fields with the agility of Cubs, and the prop-driven ones hit better than 200 mph in level flight. Despite the bulky fuselage characteristics, these planes are well streamlined at the juncture of wings and tail surfaces, a factor greatly reducing drag. Their deep fuselage and high-mounted wing permit use of an exceptionally low landing gear arrangement. This not only saves weight but precludes damage to the engines in the event of a wheel-up landing. The bottom of the fuselage is heavily reinforced to withstand belly landings, while the cockpit is beefed up with an internal tubular structure in case of head-on

Powered version of G-18A was C-122, first truly successful glider-to-powerplane.

Largest glider ever built in U.S. was XG-20 with capacity for more than 60 passengers.

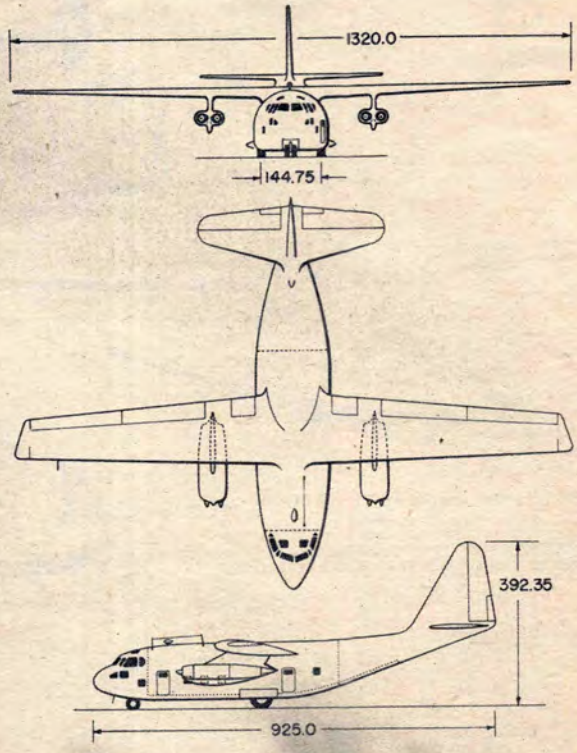
XC-123 came from XG-20; wt. 25,000 lbs. empty; payload 20,000 lbs.+; range 1335 mi.



collision with obstacles during military operations.

In the past, many attempts were made to convert gliders into power planes by hanging engines on the wings. The Germans did it with the boom-tail Gotha GO-242 and the 181-ft.-span Messerschmitt Me-321; the British with the Hamilcar, and we ourselves mounted various powerplants on the Waco CG-4. None of them came near the performance of the Chase machines. To top it all, these aircraft can tow one another, if necessary.

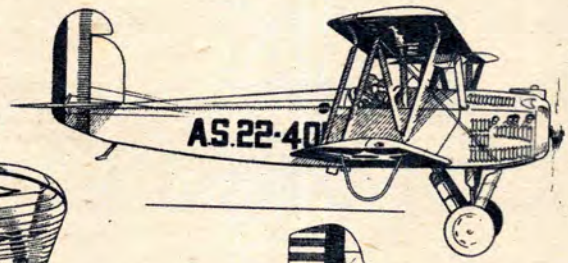
Thus, Russian-born Mike Stroukoff joins the two other notable Russian designers, Sikorsky and Seversky, in contributing to American aviation.



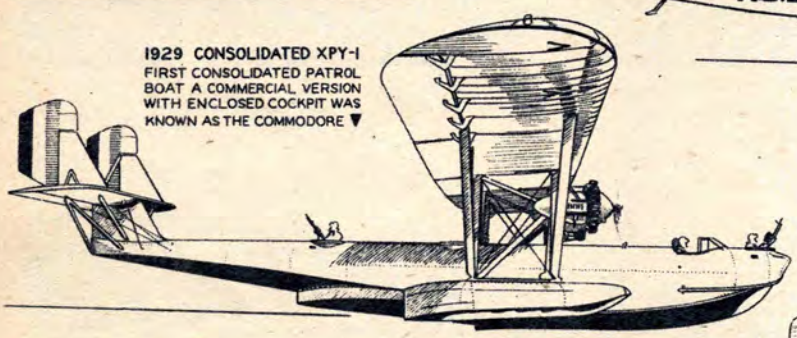
AIR PROGRESS

By DOUGLAS ROLFE

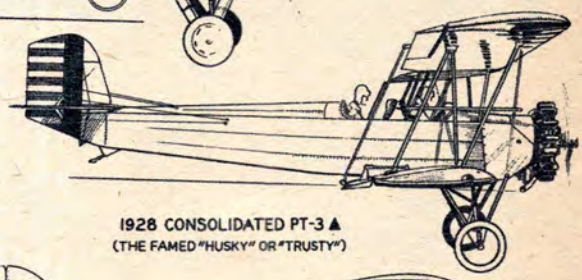
THE CONSOLIDATED VULTEE STORY



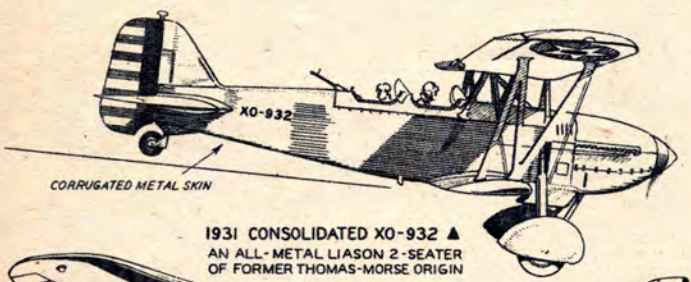
◄ 1923 CONSOLIDATED TW-3
FIRST CONSOLIDATED PRODUCTION WAS THIS SIDE-BY-SIDE SEATING MILITARY TRAINER. WITH 150-H.P. HISSO-WRIGHT ENGINE THE TW-3 WAS ACTUALLY DESIGNED BY THE FORMER DAYTON-WRIGHT FIRM.



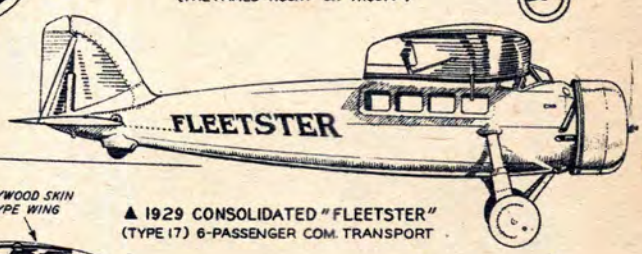
1929 CONSOLIDATED XPY-1
FIRST CONSOLIDATED PATROL BOAT A COMMERCIAL VERSION WITH ENCLOSED COCKPIT WAS KNOWN AS THE COMMODORE ▼



1928 CONSOLIDATED PT-3 ▲
(THE FAMED "HUSKY" OR "TRUSTY")



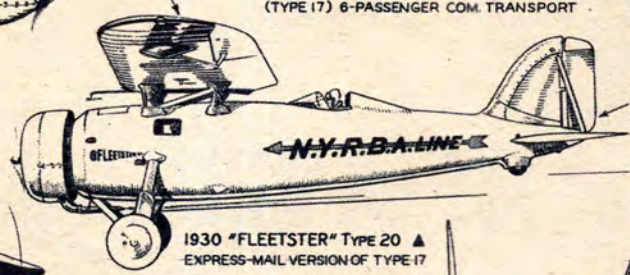
CORRUGATED METAL SKIN



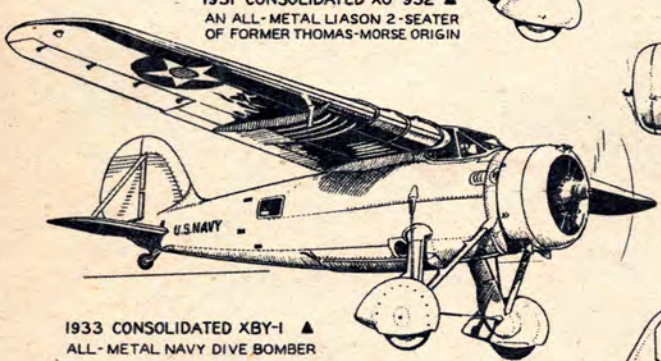
PLYWOOD SKIN TYPE WING

▲ 1929 CONSOLIDATED "FLEETSTER"
(TYPE 17) 6-PASSENGER COM. TRANSPORT

1931 CONSOLIDATED XO-932 ▲
AN ALL-METAL LIASON 2-SEATER OF FORMER THOMAS-MORSE ORIGIN

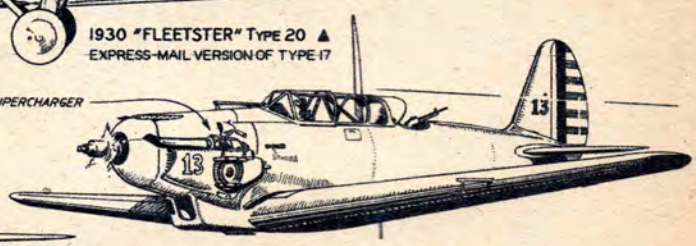


ALL-METAL FUSELAGE AND TAIL ASSEMBLY

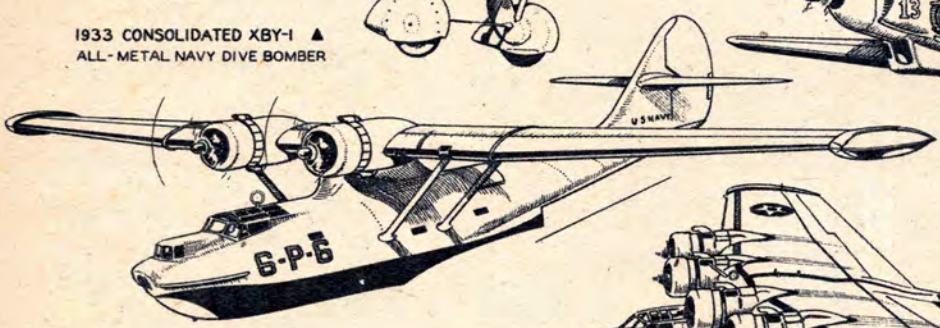


1930 "FLEETSTER" TYPE 20 ▲
EXPRESS-MAIL VERSION OF TYPE 17

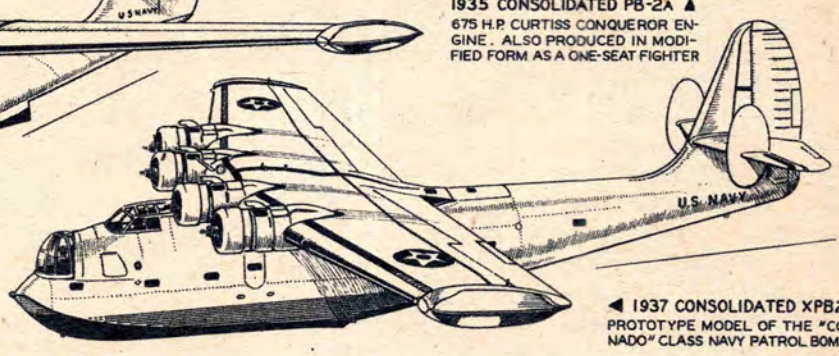
SUPERCHARGER



1933 CONSOLIDATED XBY-1 ▲
ALL-METAL NAVY DIVE BOMBER



1935 CONSOLIDATED P8-2A ▲
675 H.P. CURTISS CONQUEROR ENGINE. ALSO PRODUCED IN MODIFIED FORM AS A ONE-SEAT FIGHTER

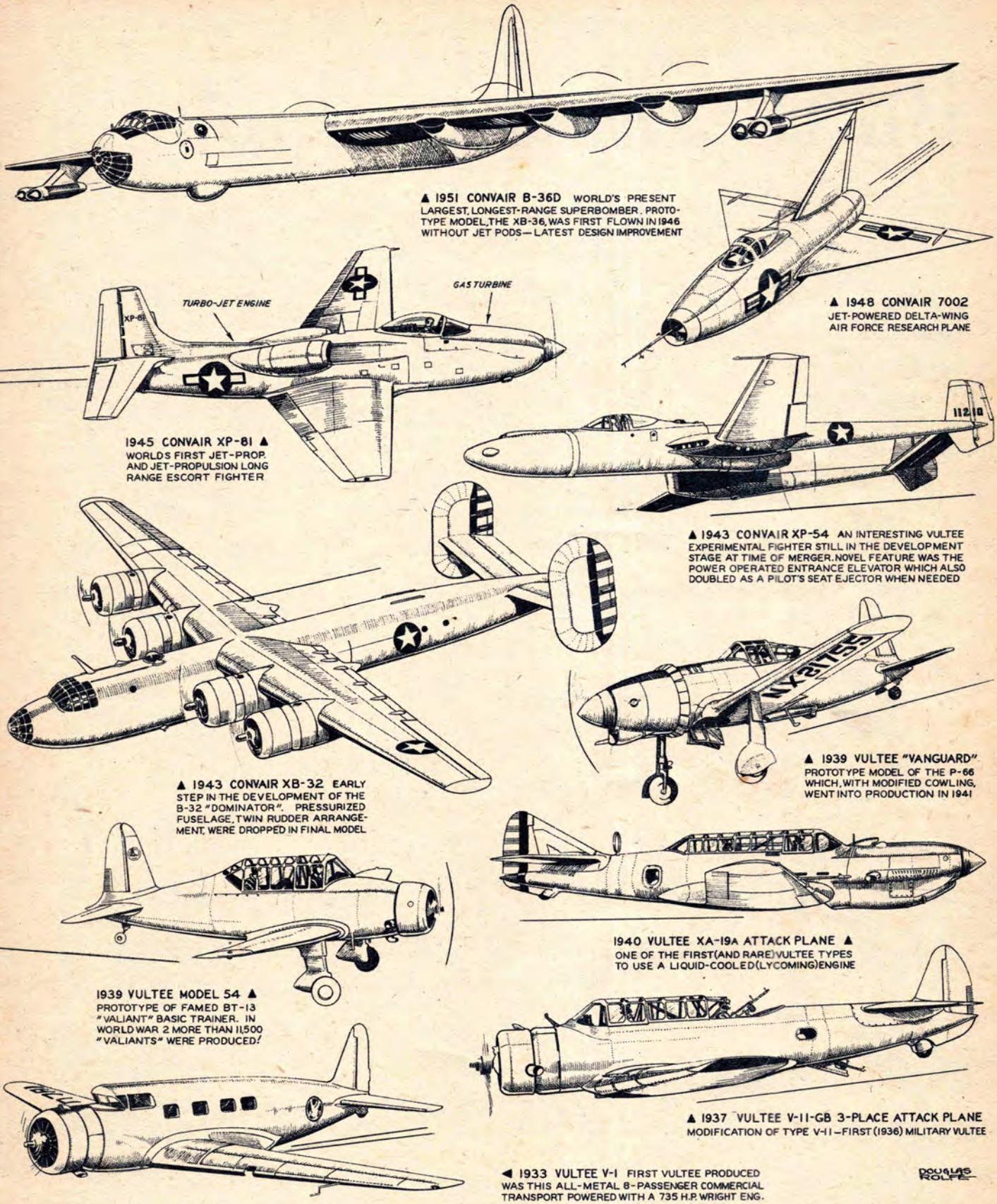


1936 CONSOLIDATED PBY-1 "CATALINA" ▲
WITH VARIOUS MINOR MODIFICATIONS THE FABULOUS CATALINA BECAME ONE OF MOST WIDELY USED LONG-RANGE PATROL BOATS OF WORLD WAR 2 AND BECAME EQUALLY FAMOUS AS A RESCUE SHIP

◄ 1937 CONSOLIDATED XPB2Y-1
PROTOTYPE MODEL OF THE "CORONADO" CLASS NAVY PATROL BOMBER

The Consolidated Vultee story at first glance begins in the early Forties when these two major aviation companies merged to form the present one. However, each in turn had previously absorbed much older aviation firms, so that the present management is actually linked up with the fledgling days of flight. Consolidated itself was founded by Maj. Reuben H. Fleet in 1923, at which time it took over the old Dayton-Wright and even more "ancient" Gallaudet companies. Having also acquired the assets of the famous Thomas-Morse outfit, it produced at least one Thomas-Morse design under its own label.

Consolidated's initial fame stems from the long line of military trainers it produced in the Twenties. Their very nicknames—the "Husky," the "Trusty"—give some indication of the rugged, foolproof characteristics of these ships. Early turning to all-metal construction, Consolidated furthermore



▲ 1951 CONVAIR B-36D WORLD'S PRESENT LARGEST, LONGEST-RANGE SUPERBOMBER. PROTOTYPE MODEL, THE XB-36, WAS FIRST FLOWN IN 1946 WITHOUT JET PODS — LATEST DESIGN IMPROVEMENT

▲ 1948 CONVAIR 7002
JET-POWERED DELTA-WING AIR FORCE RESEARCH PLANE

1945 CONVAIR XP-81 ▲
WORLD'S FIRST JET-PROP. AND JET-PROPULSION LONG RANGE ESCORT FIGHTER

▲ 1943 CONVAIR XP-54 AN INTERESTING VULTEE EXPERIMENTAL FIGHTER STILL IN THE DEVELOPMENT STAGE AT TIME OF MERGER. NOVEL FEATURE WAS THE POWER OPERATED ENTRANCE ELEVATOR WHICH ALSO DOUBLED AS A PILOT'S SEAT EJECTOR WHEN NEEDED

▲ 1943 CONVAIR XB-32 EARLY STEP IN THE DEVELOPMENT OF THE B-32 "DOMINATOR". PRESSURIZED FUSELAGE, TWIN RUDDER ARRANGEMENT, WERE DROPPED IN FINAL MODEL

▲ 1939 VULTEE "VANGUARD"
PROTOTYPE MODEL OF THE P-66 WHICH, WITH MODIFIED COWLING, WENT INTO PRODUCTION IN 1941

1940 VULTEE XA-19A ATTACK PLANE ▲
ONE OF THE FIRST (AND RARE) VULTEE TYPES TO USE A LIQUID-COOLED (LYCOMING) ENGINE

1939 VULTEE MODEL 54 ▲
PROTOTYPE OF FAMED BT-13 "VALIANT" BASIC TRAINER. IN WORLD WAR 2 MORE THAN 11,500 "VALIANTS" WERE PRODUCED!

▲ 1937 VULTEE V-11-GB 3-PLACE ATTACK PLANE
MODIFICATION OF TYPE V-11 — FIRST (1936) MILITARY VULTEE

◀ 1933 VULTEE V-1 FIRST VULTEE PRODUCED WAS THIS ALL-METAL 8-PASSENGER COMMERCIAL TRANSPORT POWERED WITH A 735 H.P. WRIGHT ENG.

DOUGLAS ROLFE

pioneered in the field of large all-metal flying boats.

Vultee was started by Jerry Vultee in 1932, and links up by various means with the old Stinson firm. A top-notch aviation engineer and pilot, he concentrated from the beginning on all-metal, stressed-skin design. A few of the Vultee designs appear on the right-hand page. Their advanced nature for the time and period will be at once apparent.

The present-day Convair company (Consolidated Vultee Aircraft Corporation) is currently engaged in producing commercial airliners besides many world-renowned military designs. It also makes pilotless aircraft, guided missiles and other items in the restricted project class.

The illustrations are arranged as far as possible to show separately the development of Consolidated and Vultee types. Many notable designs, such as the B-24 Liberator, are omitted as they appeared in Air Progress previously.

BIRTH OF THE MIDGETS

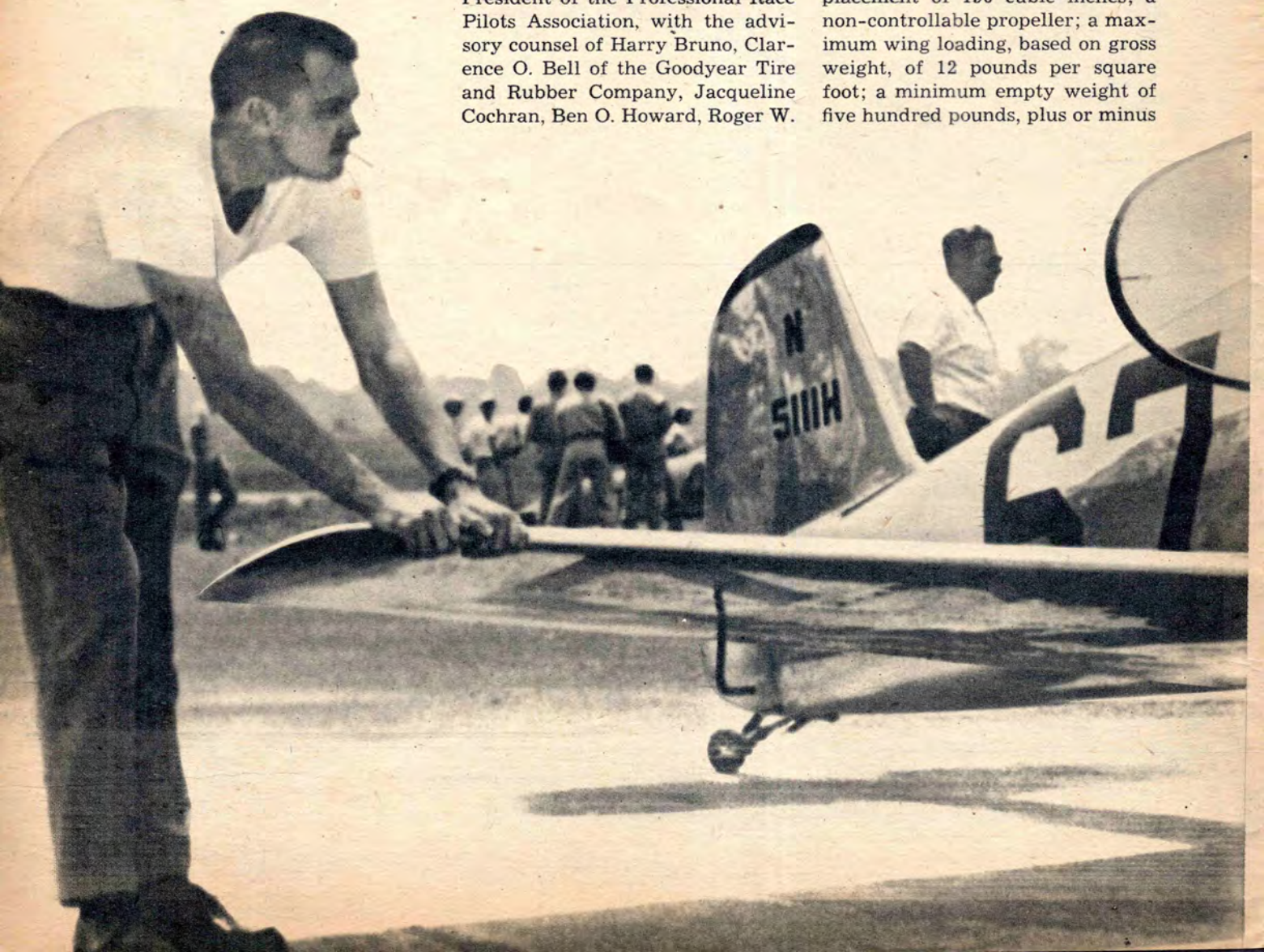
Low, sleek 'n' speedy, these wee racers point up the proposition that good things come in small packages. Ask Charlie, he knows

By CHARLES S. LOGSDON
Director, Contest Division
National Aeronautic Association

■ Midget aircraft design and races over a small course in front of grandstands were first discussed generally by participants and officers of the 1939 National Air Races at Cleveland, Ohio. At that time there were only four Greve Trophy Racers (550 cubic inch displacement engines) in existence, which indicated that a new and safer type of racing aircraft must be developed. Nothing tangible came from these initial discussions until after World War II. The foremost proponent of the new midget class of racers was probably Ben O. Howard, noted race pilot and currently an executive of Fairchild Aircraft.

In 1946, the late "Art" Chester, President of the Professional Race Pilots Association, with the advisory counsel of Harry Bruno, Clarence O. Bell of the Goodyear Tire and Rubber Company, Jacqueline Cochran, Ben O. Howard, Roger W. Kahn of the Grumman Aircraft Engineering Corporation and West Coast members of PRPA, developed the original specifications for the 190 cubic inch class of racing aircraft. These were approved formally by the National Aeronautic Association's Contest Board at a December 1946 meeting, at which time Goodyear announced it would sponsor a new series of lightplane races at the National Air Races in 1947, 1948 and 1949 to the extent of $25,000 in cash prizes each year.

The original lightweight race plane design specs called for a single-place aircraft; a CAA-approved Type Certificated engine having a maximum cylinder displacement of 190 cubic inches; a non-controllable propeller; a maximum wing loading, based on gross weight, of 12 pounds per square foot; a minimum empty weight of five hundred pounds, plus or minus



one percent; a non-retractable landing gear; minimum vision requirements for the pilot; a 15-gallon fuel tank; and prior approval of design drawings by a competent Technical Committee.

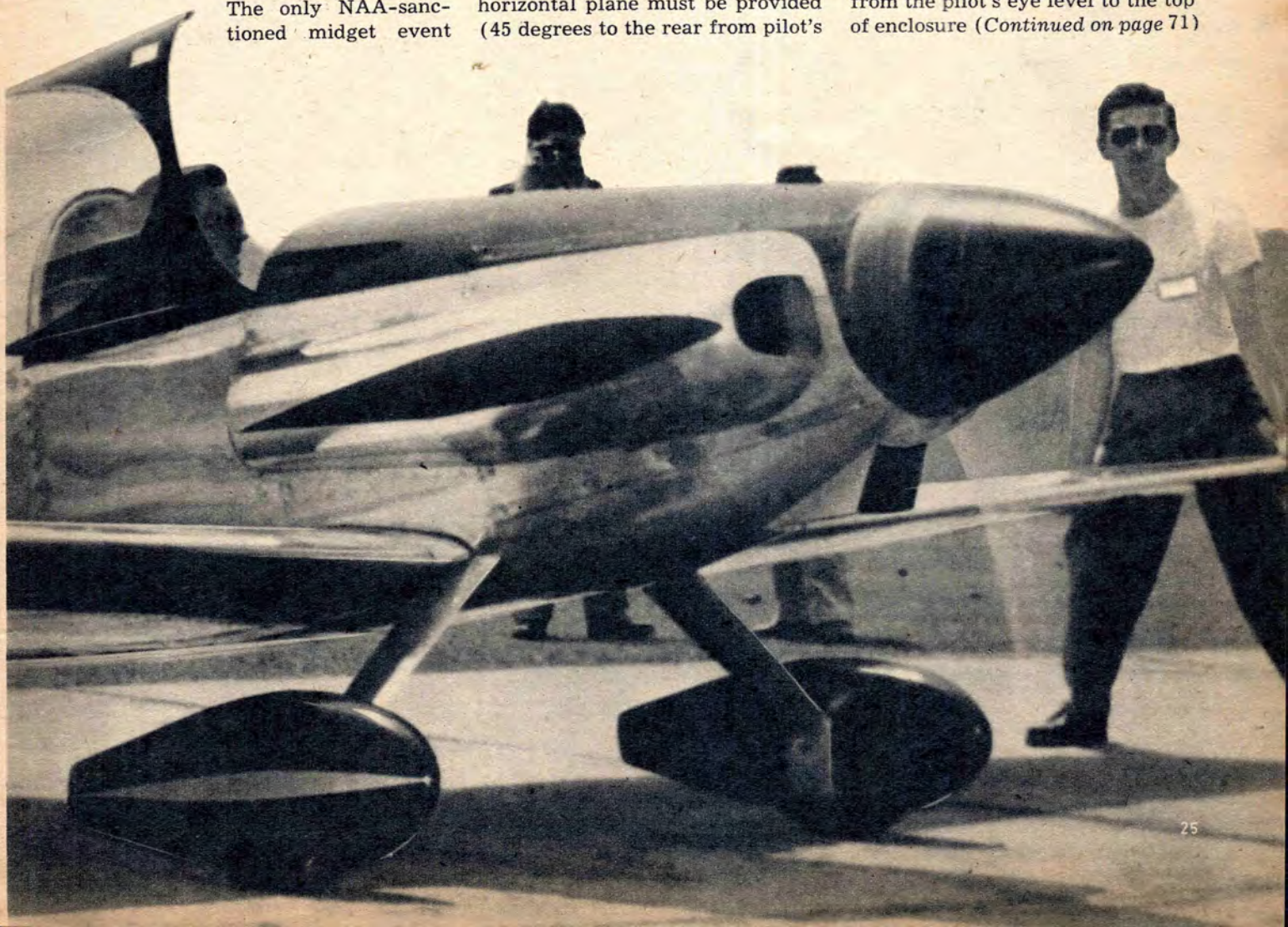
In addition, flight demonstrations were required at high altitude, in plain view of a Technical Committee, to assure desired airworthiness before each aircraft was permitted to fly low around the race course at high speeds. Pilot requirements stipulated that each contesting pilot have a minimum of 500 solo hours. However, a pilot could qualify if he had a minimum of 200 solo hours, plus 30 hours in the ship to be flown in the race. All pilots were required to have at least two hours and 5 take-offs and 5 landings in the particular ship to be flown in the race or one of identical design prior to their initial aircraft qualification attempt.

The new midget class of races was announced formally early in 1947. The only NAA-sanctioned midget event during that year was the Goodyear Trophy Race at the 1947 National Air Races, where twelve of these new aircraft qualified officially for entry. The first three winners of the 1947 Goodyear Trophy Race final (15 laps of a 2.214 mile course), in their respective order, were:

Race No.	Pilot	Speed (mph)	Purse
20	William Brennand	165.9	$7000
5	Paul Penrose	165.4	4000
10	H. R. Salmon	158.8	2000

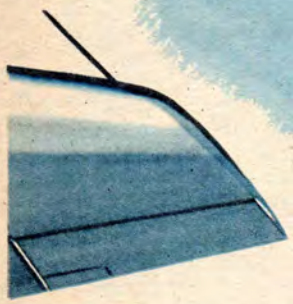
The 1947 specifications for the 190 cubic inch class of racers were subsequently amended slightly by the Professional Race Pilots Association and approved by NAA. These minor revisions, effective January 1, 1948, prohibited the enlargement of engine ports; required a minimum wing area of sixty-six square feet; permitted specifically the use of flaps, indicating that wing area should be calculated with flaps retracted; and specified that the vision specs, for better pilot visibility, be improved; a field of vision of 270 degrees in the horizontal plane must be provided (45 degrees to the rear from pilot's eyes in both directions), 140 degrees from the top of cowling upward and aft; 25 degrees from the pilot's eyes to top of leading edge of the wing at the fuselage, and 5 degrees down to top of cowling. Obstructions in this field, such as the top wing of a biplane or a high wing type monoplane, must be submitted in one-quarter inch scale to the Technical Committee of the NAA Contest Board for approval. The cockpit canopy must provide a minimum of six inches from the pilot's eye level to the top of enclosure (*Continued on page* 71)

Charlie Logsdon and speed-man Steve Wittman hold confab before an air race.



Flying Flattops

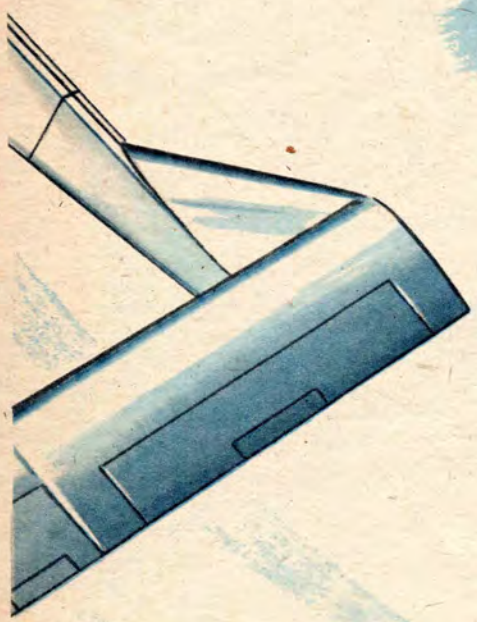
Aerial carriers are another solution for interception of fast long-range enemy A-bomb raiders



■ The shadow of the A-bomb bears heavily over American cities. . . . Yet if we depend on the conventional radar-flak-plane setup to defend our major areas from a Red-A attack, it would take a force the size of the Normandy invasion to protect eleven of our most important cities, and that with only 40 to 50 percent effectiveness. Guided missiles, which appear to be our best bet from the standpoint of accuracy and economy, are at least three years in the future.

The place to stop the Red bombers headed for Detroit is over the Arctic Ocean, not over Lake Huron. This problem calls for a type of interception similar to an aircraft carrier, in locations and at conditions of speed and altitude where the carrier is out of its element. Thus the solution, for the time being, is to project aircraft carrier characteristics into the sky to meet the enemy more than halfway.

Experience with our B-36 bombers indicates that the current type of fighter suffers from certain disadvantages when attacking a bomber, and one of the best ways to restore its position of combat superiority and still permit it to be used against bombers a long way from the target, is the flattop in the sky.



For exploration of this idea, Vincent J. Burnelli "designed" an airplane, or rather a flying task force, that would be able to cope with the current problem. The Flying Flattop is a four-engined aircraft a little larger than the B-36, an adaptation of Burnelli's airfoil fuselage idea. It has a lifting body 80 ft. by 80 ft., with outboard wing panels bringing the span to a total of 250 ft. The plane is 120 ft. long and would be powered by four 10,000 hp gas turbines.

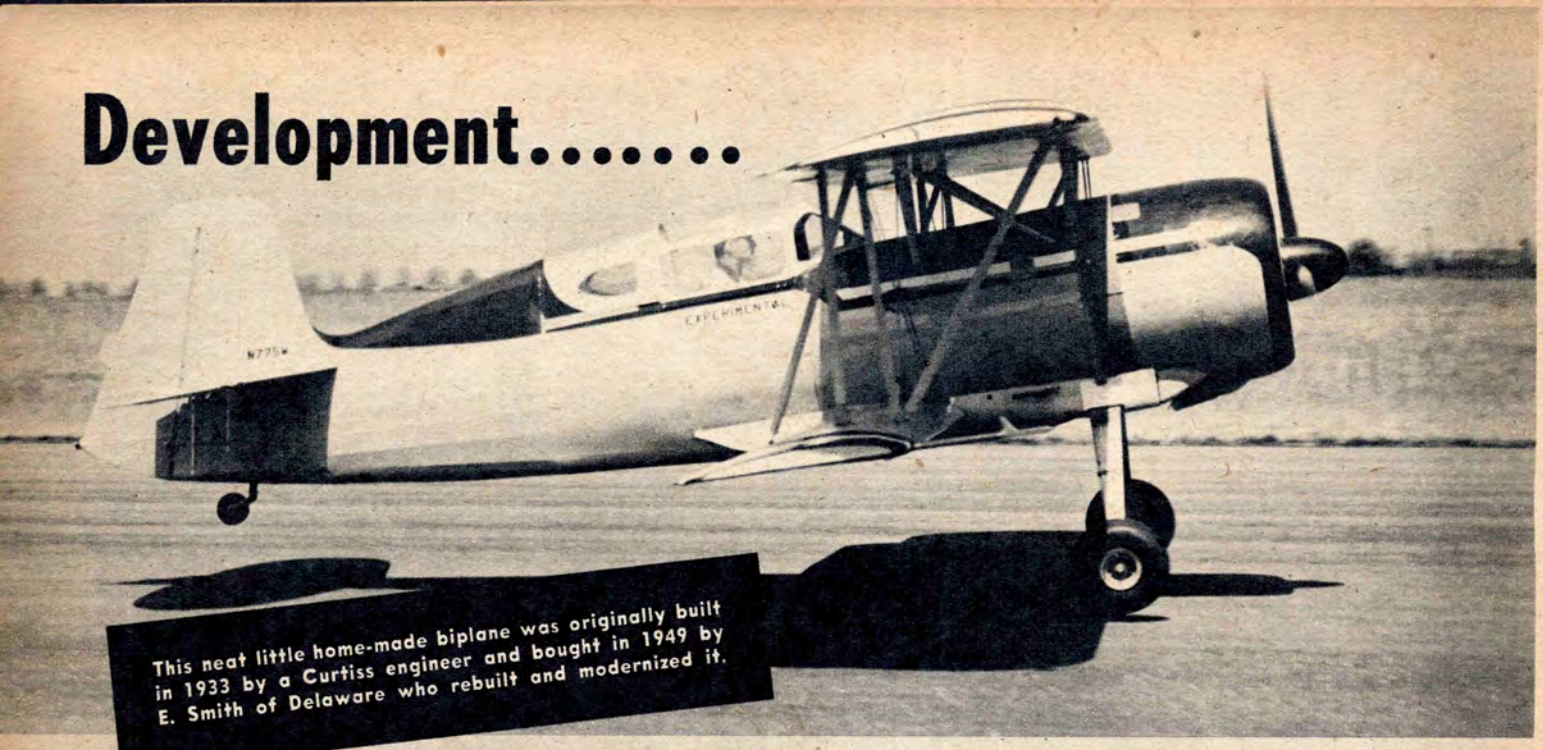
The front and sides of the airfoil fuselage would be devoted to crew facilities and to search radar. Because of its size and capacity, some five tons of radar equipment could be carried with radar antenna as large and accurate as those of any ground station.

Inside the fuselage, most of the area would be occupied by the hangar housing a full dozen Burnelli-type fighters embodying the same lifting fuselage characteristics and powered by two jet engines. To increase range, the fighters would be equipped with a telescoping wing system which allows a section of the wing to slide in and out, folding wings and tail booms to facilitate stowage.

Planes would be carried inside an overhead trolley system hung on a retractable hook. They would be launched and recovered through a trap-door forming a portion of the lower fuselage skin and sliding back like a Fowler flap. In the event of action, the first two fighters launched would act as protectors for the flattop, taking position above and below the mother ship, with the other ten going after the enemy. Their relative low wing loading would give them an advantage over the invading bombers. The flattop would have provision for in-flight refueling of the fighters, and as most refueling equipment is reversible, the carrier could take on fuel in flight, increasing the length of time for remaining out on patrol.

Burnelli also points out that such an aircraft would not become obsolete with the advent of guided missiles, as it represents an ideal platform for air launching of air-to-air or even air-to-ground missiles.

Development.....

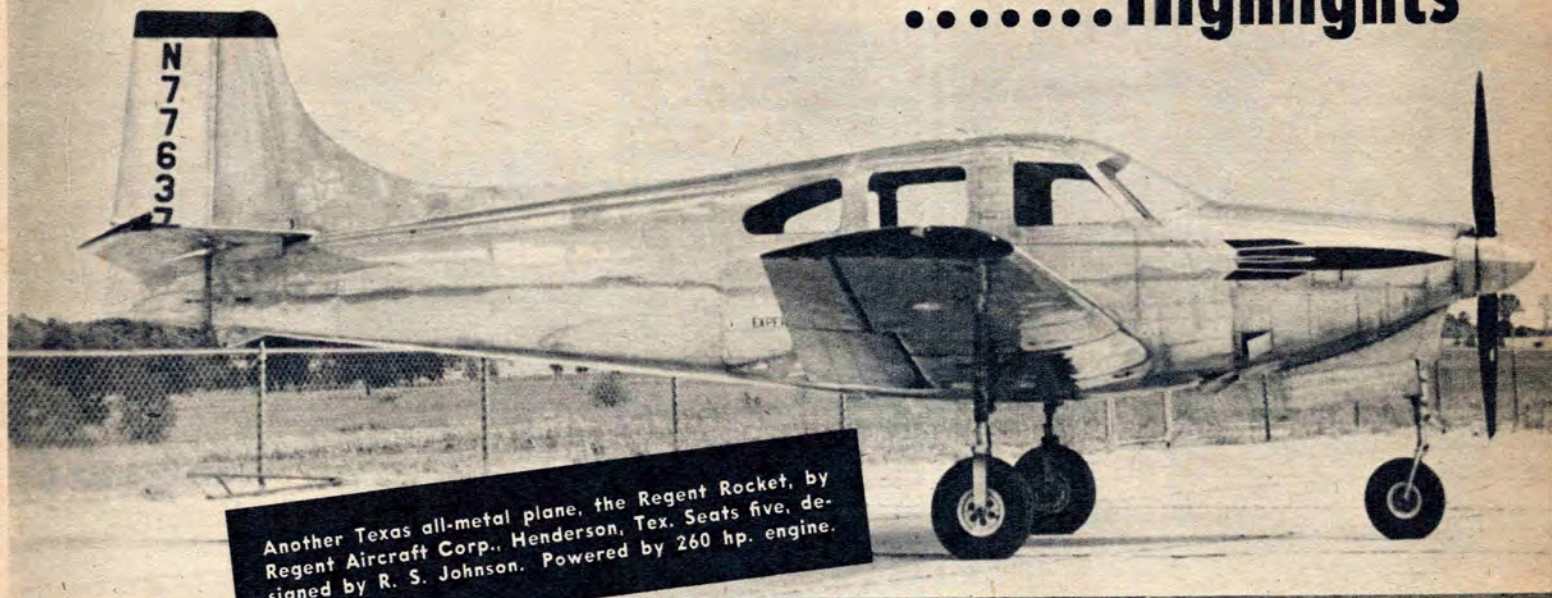


This neat little home-made biplane was originally built in 1933 by a Curtiss engineer and bought in 1949 by E. Smith of Delaware who rebuilt and modernized it.

The Texas Bullet, a new all-metal 4-place personal plane built by Aircraft Mfg. Co., Tyler, Tex. Engine 205 hp Continental, span 28 ft., length 23.15 ft., 190 mph tops.

Sikorsky YH-18A helicopter for Army Field Forces. Note unusual fixed horizontal stab. Powered by a 245 hp flat six Franklin engine, top speed of 113 mph, room for 4.

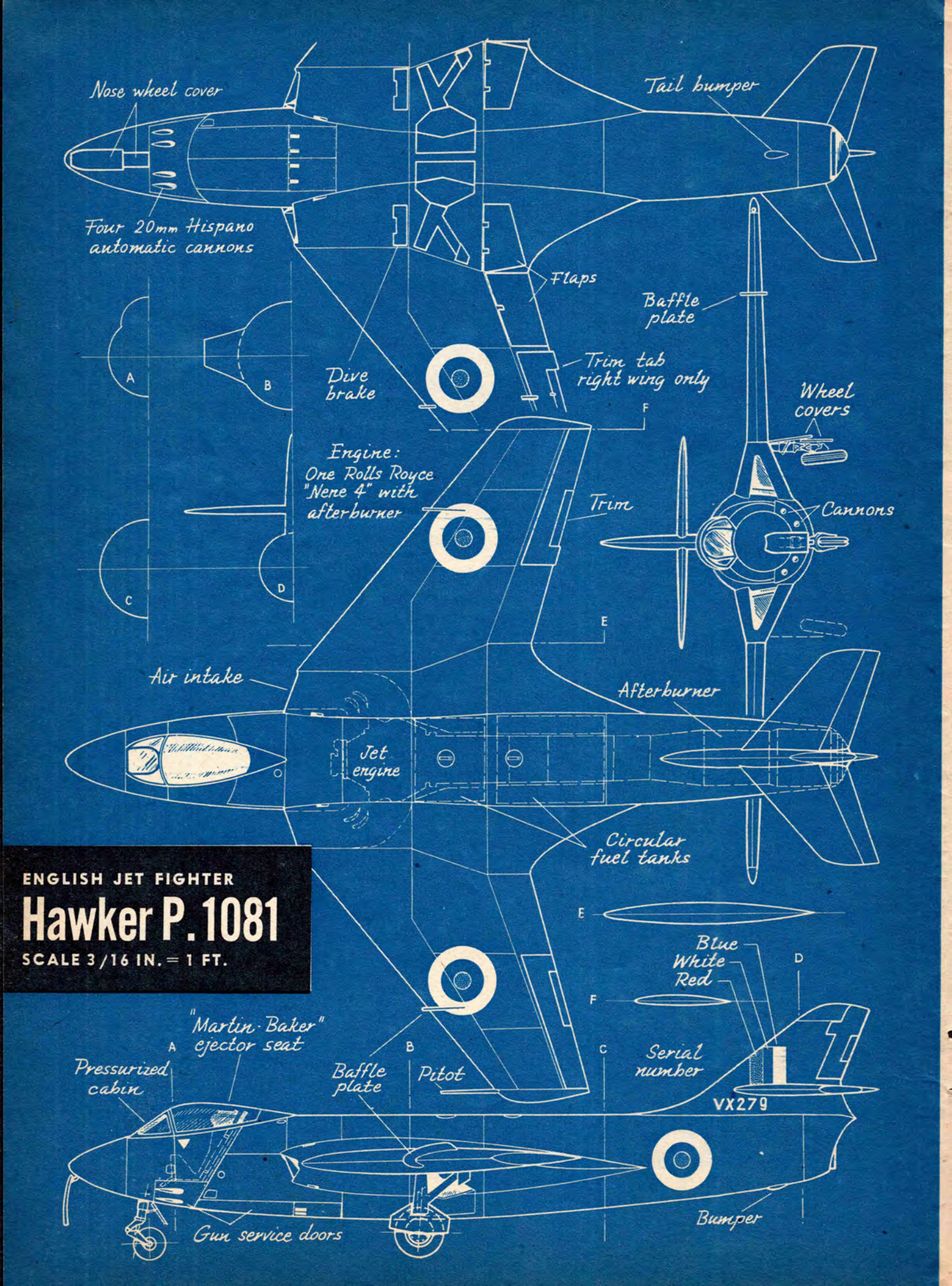
.....Highlights



Another Texas all-metal plane, the Regent Rocket, by Regent Aircraft Corp., Henderson, Tex. Seats five, designed by R. S. Johnson. Powered by 260 hp. engine.

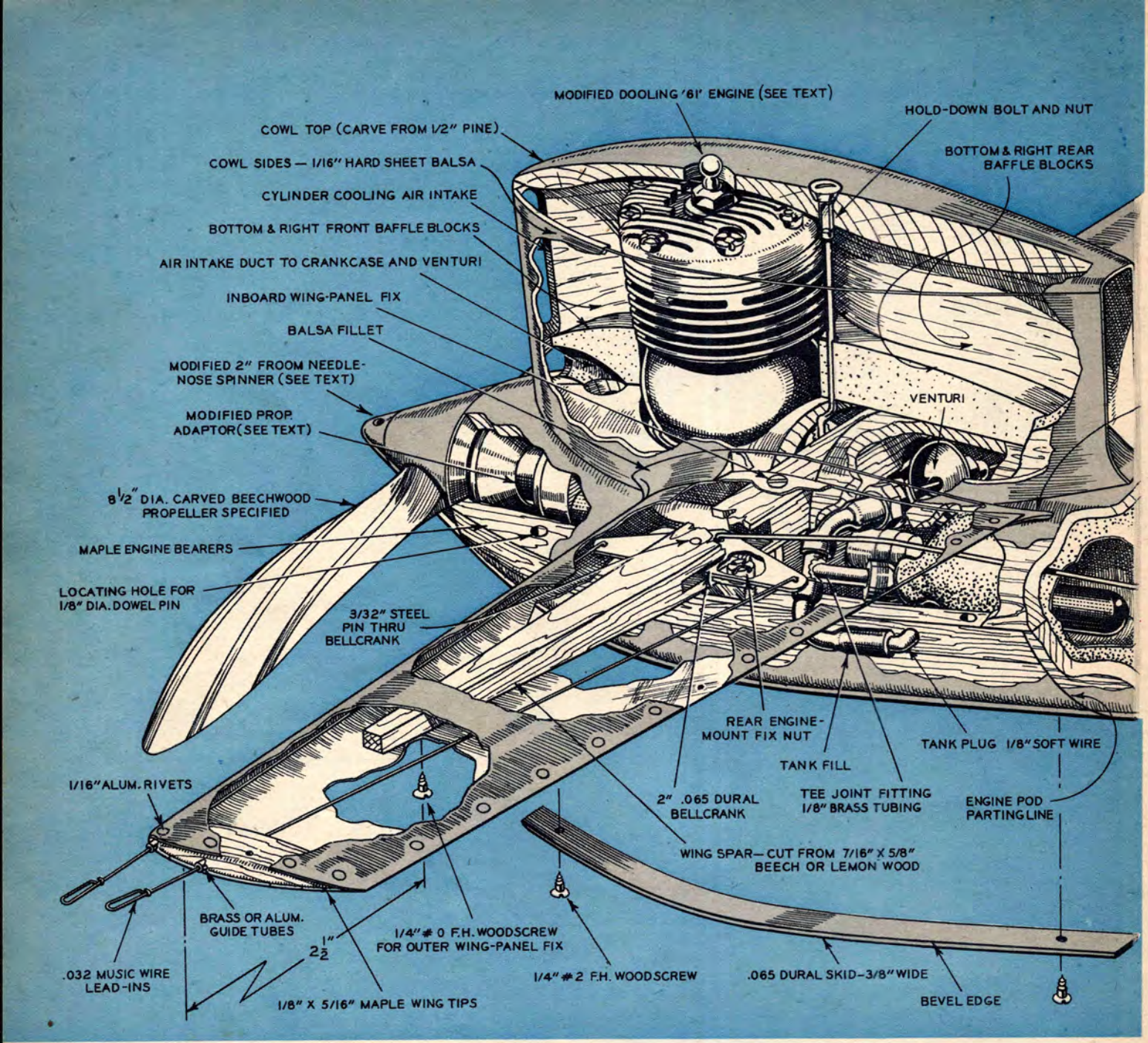
Fouga Gemeaux (twins). Now the French went and done it. Two Fouga Sylphe jet powered sailplanes joined together. Top speed 185 mph. +, ceil. 20,000 ft.

Lockheed P2V-5, latest version of the famous submarine patrol plane. Note large radome on underside of fuselage. Turbo-Cyclone compound engines, 3250 hp. each.


Nose wheel cover
Tail bumper
Four 20mm Hispano automatic cannons
Flaps
Baffle plate
Trim tab right wing only
Dive brake
Wheel covers
Engine: One Rolls Royce "Nene 4" with afterburner
Trim
Cannons
Air intake
Afterburner
Jet engine
Circular fuel tanks
ENGLISH JET FIGHTER
Hawker P.1081
SCALE 3/16 IN. = 1 FT.
Blue
White
Red
"Martin-Baker" ejector seat
Pressurized cabin
Baffle plate
Pitot
Serial number
VX279
Gun service doors
Bumper

the Changing Air World

In the beginning there was the dream. The dream was followed by fragile machines, first in model form, then as wood, wire and canvas contraptions which culminated in the Wright biplane. During those early days of flight the pilot was king to his public, a slave to his plane. He was designer, builder, mechanic. Two great wars changed all that. Today is the time of the technician. Never before has there been such demand for the draftsman, the designer, the mechanically inclined. This intent young man at NACA's Wallops Island (Va.) station is helping to usher in another era—one in which the airplane will part company with the pilot. He is shown with a Delta-wing, rocket-powered research model used to obtain aerodynamic data on wing shapes, stability and control effectiveness. The dream changes. . . .



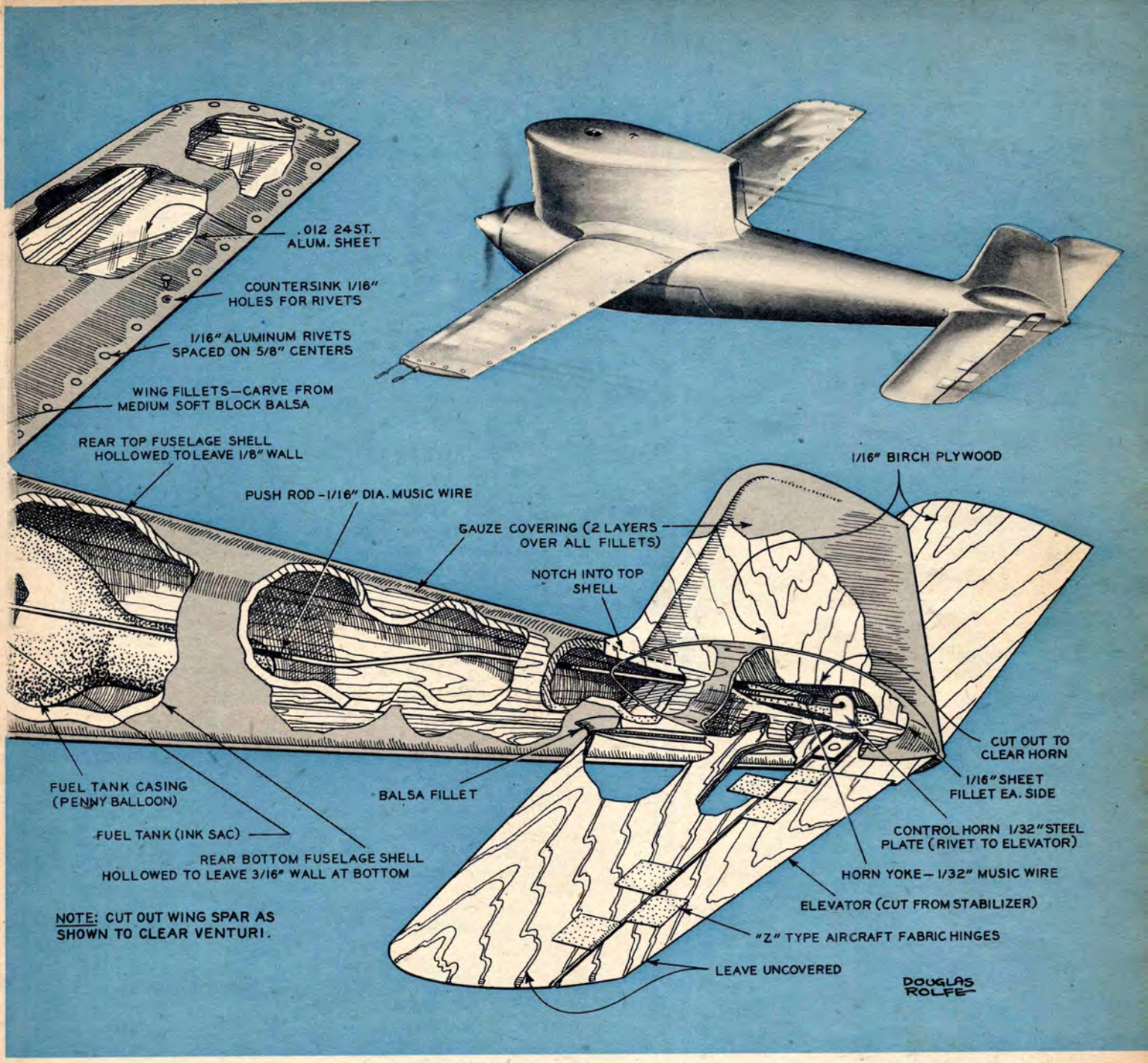
The Screamin' Demon

One of America's top speed winners gives you the inside story of his special model and fuel system

By **BILL WISNIEWSKI**

■ This model is the latest of a series of about ten speed models, one of which won the National Senior Class D speed event. It is a smaller and much faster airplane than my winner and has been timed at more than 150 mph in recent test flights.

Most of the trouble I had in the past few years has been with fuel tanks. Probably you have experienced the same difficulties. The tank I am now using is a very high-pressure one. The theory is simple: If you have ever blown up a balloon you will know that it is hard to start but once started takes the same pressure to finish the job. The same applies to the tank employed on this model. Once it is inflated with fuel and the engine started, the pressure remains constant until almost the last moment when the pressure in-



creases and has a tendency to enrich the mixture.

The tank is made of a *natural* rubber ink sac from an ordinary fountain pen (these may be obtained from any fountain pen repair shop and cost about 15 cents), a piece of Neoprene tubing and a penny balloon. To assemble tank cut the ink sac down to 2 inches in length, slip the Neoprene tubing to the bottom of the sac and wrap tightly with thin wire or thread. Put about 8 drops of castor oil into the balloon and then insert the sac into the balloon. The oil is very important as without it the tank is liable to break immediately, due to friction.

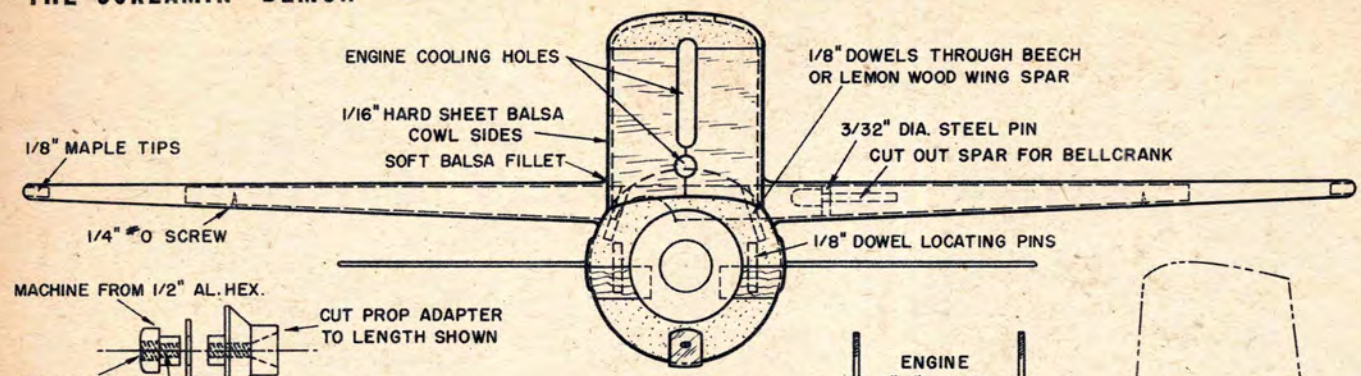
Next important factor in this model is the propeller. The one shown has worked out very well because of its constant engine speed qualities. It allows good take-off characteristics due to flexing to low pitch and a high top speed, since it returns to normal pitch once the plane is airborne. Carve the face of the prop with square tips, then carve sweepback and finally carve the top to the airfoil sections shown.

Engine modifications for the Dooling "61" are as follows. Turn or file down cylinder and head to 1⅝ in. and cut off the exhaust stack flush with the cylinder. Cut the venturi tube down to ⅞ in. in length and turn it so that the needle enters at a 45 degree angle. The mounting holes should be reamed out to take bicycle spoke nipples. Cut these nipples off so they are flush with the bottom of the mounting lugs when inserted in the mounting holes. Make the hold-down bracket and solder carefully at this point, as this fitting holds the airplane together.

Spinner is a 2 in. "needlenose" Froom cut down to 1⅜ in. diameter. Prop adapter is cut off as shown and the nut made from ½ in. aluminum hex stock. Make the fuel line Tee from ⅛ in. O.D. brass tubing.

Fuselage is built first. Select two pieces of straight-grained white pine 1¼" x 2½" x 16" and either turn or carve to the shape and (*Continued on page* 65)

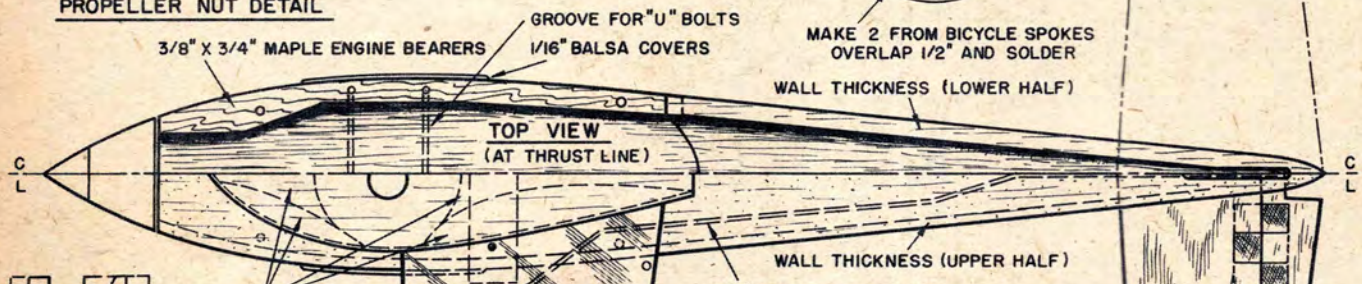
THE SCREAMIN' DEMON

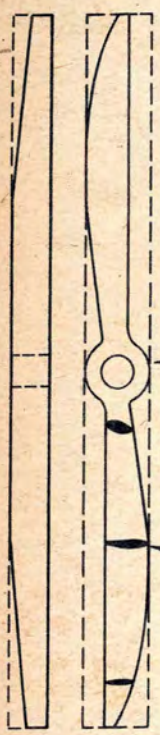


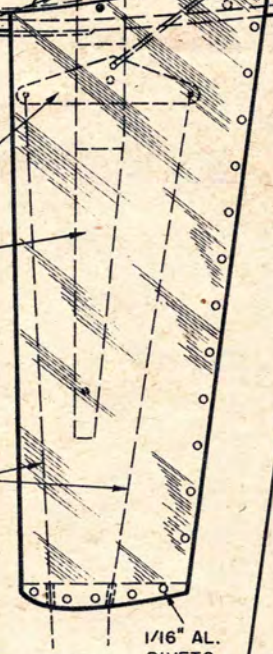
FRONT VIEW

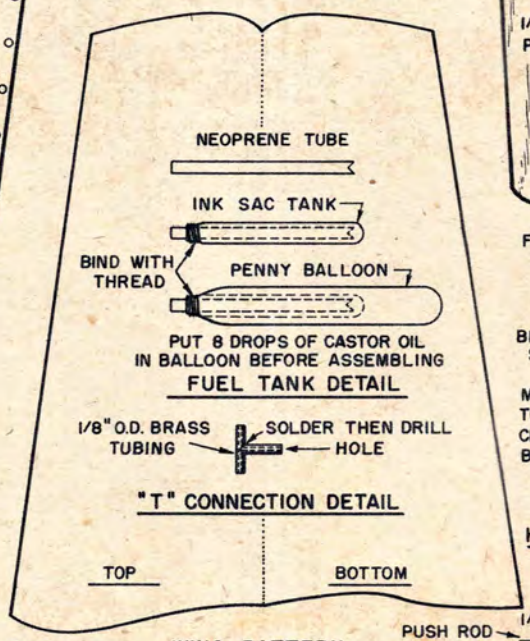
PROPELLER NUT DETAIL

MAKE 2 FROM BICYCLE SPOKES OVERLAP 1/2" AND SOLDER

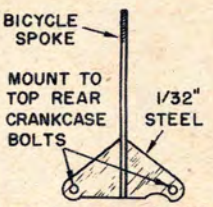








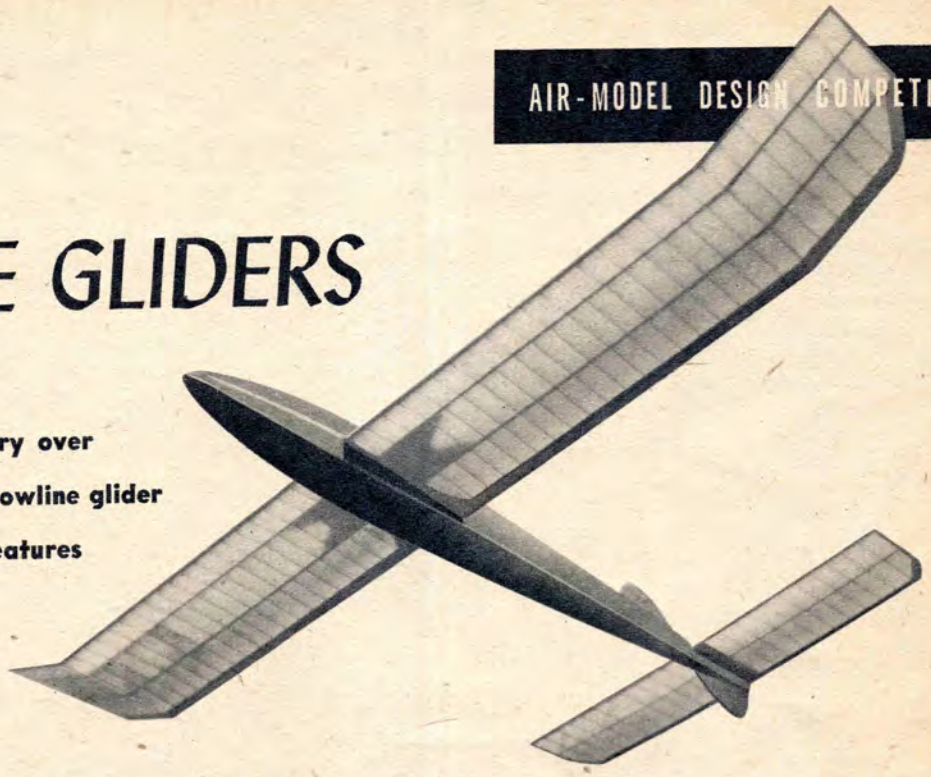
WING PATTERN
.012 24 ST ALUMINUM
(2 REQ.)



HOLD DOWN PLATE DETAIL

CONTROL HORN DETAIL (TOP VIEW)

TOWLINE GLIDERS



English designer scores victory over all contenders in AT's model towline glider contest; Nordic-type craft features novel wing and stab mount

■ While the sky-rocket climb of a powered model may be exciting, nothing can give more satisfaction than the graceful maneuvers of a towline glider being borne aloft by a friendly thermal.

In America we handicapped gliders for years by allowing only 100 feet of towline and requiring a tremendous fuselage cross section. In contrast the Europeans could use more than 300 feet of towing line and a very slim fuselage. Yet we managed to rack up some surprisingly high times. The short towline led us to develop gliders that were distinctly different from the Continental type.

We found that 100 feet of towline does not give the model much time for thermal hunting. Ground disturbance is high and thermals are always scattered. The model must

start tight circling as soon as it comes off the line to take advantage of small up-lift areas. Characteristics of such a glider are short coupled wing and stab, and relatively large dihedral.

On the other hand, 300 feet of towline allows a more leisurely, roaming flight to pick up fully developed thermals or to obtain optimum glide. Such conditions do not require super-stability or exceptional spiral control. Hence, the basic Continental design has a relatively long moment arm and small dihedral.

Incidentally, our rules are now more reasonable: 200 foot of towline and length 2/200 fuselage cross section.

While a tight circling glider may take full advantage of an individual thermal to go out of sight straight up, a roaming Continental design will go out of sight on the horizon. A sort of bouncing trip from one thermal to another in honey bee fashion. You can see that conditions determine the regional design.

While we were developing our own style of glider design, the Scandinavian flyers came up with something a little different. The basic characteristics were a very slim fuselage, long moment arm, thin but deeply undercambered airfoil and small tail surfaces. Another characteristic which is especially noticeable to the American builders is the comparatively small tip dihedral "area" used at high angles.

At first Scandinavian glider sizes varied, but there was gradually formulated a design now known as the "Nordic A/2". They found that when all requirements — building time and cost, transportation and performance — were considered, a glider having a total surface area of between 495 sq. in. and 526 sq. in. will give the best return for the time and money. The standard F.A.I. fuselage cross section formula, Wing Area/100, is used.

This month's winning towline glider design is based on the Nordic formula. The designer is not a Scandinavian, but an Englishman, E. G. Currington, from Manchester. The English model builders have adopted this particular type of glider whole-heartedly, and they are going in strong for the category.

This design has many features not normally found on our type of gliders, such as the tongue and box connection of the wing to the fuselage. It is a feature that should be investigated. The tendency for many builders to progress from small size to larger sizes is eventually

---

ABOUT THE DESIGNS: You are not required to build a model in this contest! All you do is submit detailed 3-view drawings of your favorite "brain-child" in each of those categories listed (plus sketches if you are artistically inclined). These drawings should not be less than 8 x 10 inches and must show dimensions. Give data on wing sections and settings, cross sections, center of gravity, weights, proposed power and the like. It's not your drafting skill that will win, but your designing ability and imagination. AT selects meritorious designs and presents them in 3-view form; payment of $5 will be made for each one published. The top design each month will be built and test-flown by AT's design and research team and the model will be given to the winner with all the equipment that goes with it. CATEGORIES: You have until August 1, 1951, to get your design studies in the mail for Half-A free flight using any size engine up to and including .050 cu. in. disp.; until Sept. 1, 1951, to have entries postmarked for model helicopters utilizing any type of motive power. SEND YOUR DESIGNS TO: Air-Model Design, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Decision of Air Trails staff is final; because of the large number of entries received none will be returned and the editors cannot enter into correspondence concerning these.

brought to a stop when the 12 foot wing just doesn't fit into the subway or family car. This design will be a good start on which to test the tongue and box connection.

Aerodynamically, the model follows the basic Nordic design: small tip dihedral and long moment arm. Structurally, it has a simple monocoque fuselage which will take care of all sorts of landings.

Start construction with the wing as you will need it to line up the fuselage. Cut the ribs. Make a metal rib template.

The tongue-box must be made to fit the tongue well, but without binding. If you have no silk, wrap the box with thread and coat with cement. When fitting the boxes to the wing halves, assemble the two halves on the tongue. Place the wing on a flat surface. Line-up the leading edges so that they will be in a straight line. Make sure that both halves are lying flat on the surface. You can now let the cement set. Before sliding the boxes through the ribs, coat with cement the sides of the spars and the edges of the boxes.

After the initial cement has set, apply another coat at all contacts between the wing portion and the plywood box. When that has set for several hours, remove the wing from the jig, and apply cement at the bottom portion.

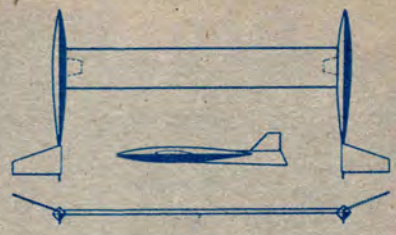
Make the stabilizer. You will need it to obtain an approximate balance while the fuselage is being constructed.

All four fuselage sides have similar outlines; only one outline pattern is needed. Select medium to light balsa, quarter grained, if possible. Cut bulkheads to dimensions which can be found from side and top views.

Before starting to assemble, cut tongue slots on sides. Make sure that slots match on both sides to prevent any off-center tongue position after assembly. Start fuselage assembly by cementing the two sides at the rear. Note the use of balsa block. Next cement the bulkheads at the leading and trailing edges of the wing. After the cement has set well, fill in bulkheads from center towards the rear. When you are sure that the center cement is well set, attach the frontal bulkheads, working from wing position towards the front.

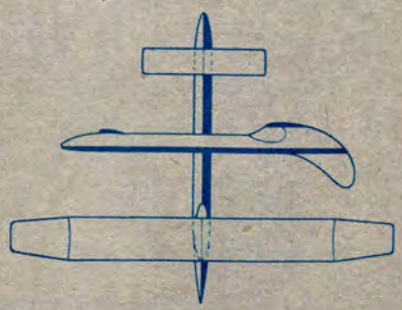
(If you (*Continued on page* 75)

A. This 76" Flying Wing's been operating 2 years. Gradual washout to 6 deg. neg. tips. Split tip elevons for drag to give tight turns. Spill-plates on tips. Tow stick with rudder used. Pod optional.
—Robert Eldridge, Bakersfield, Cal.



B

B. Here's a new note. Fuselage arrangement cuts induced drag of wing by acting as end plates. Span 56 in.; fuselage, 36 in. Half-V tail gives dihedral and fin effect. Covering is brown paper.
—Sven-Olaf Rudder, Stockholm, Sweden

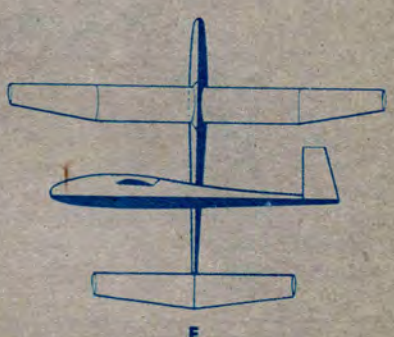


C

C. "Sandman" is canard towliner with crutch, former, stringer construction. Span 42 in.; fuselage, 32 in. Clark Y sections. Rudder is 1/16 in. sheet balsa. Wing area comes to 210 sq. in.; 9 oz.
—Jim Trissel, Greenville, Ohio

D

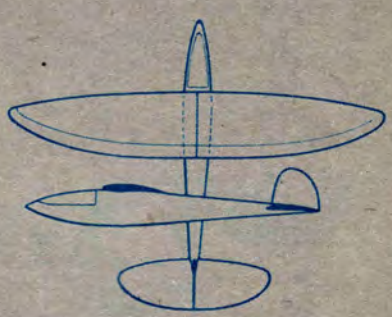
D. This is a big job with 1,300 sq. in. wing area and elliptical dihedral. Aspect ratio 13 to 1; span 1 feet. Fuselage length, 66 in. Rudder area, 10%; elevator, 24% elevator. Standard, lines.
—K. E. Dougan, Lawrence, Kans.



E

E. Tried and true diamond-on-edge fuselage design with butterfly tail featuring 250 sq. in. wing area for new AMA towliner set-up. NACA 4612 on wing; Clark Y on stab. Span 54 in.; 30" fuse.
—Fred Verrier, Baltimore, Md.

F. Another V tail, this design featuring a flexible wing trailing edge which adjusts to model's speed. Flexing area is 58.5 sq. in.; lifting wing area, 188.5 sq. in. Span, 42 in.; 1/16" sheet fuse.
—Danny R. Crago, Albuquerque, N. M.

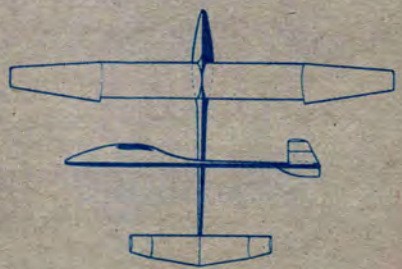


F

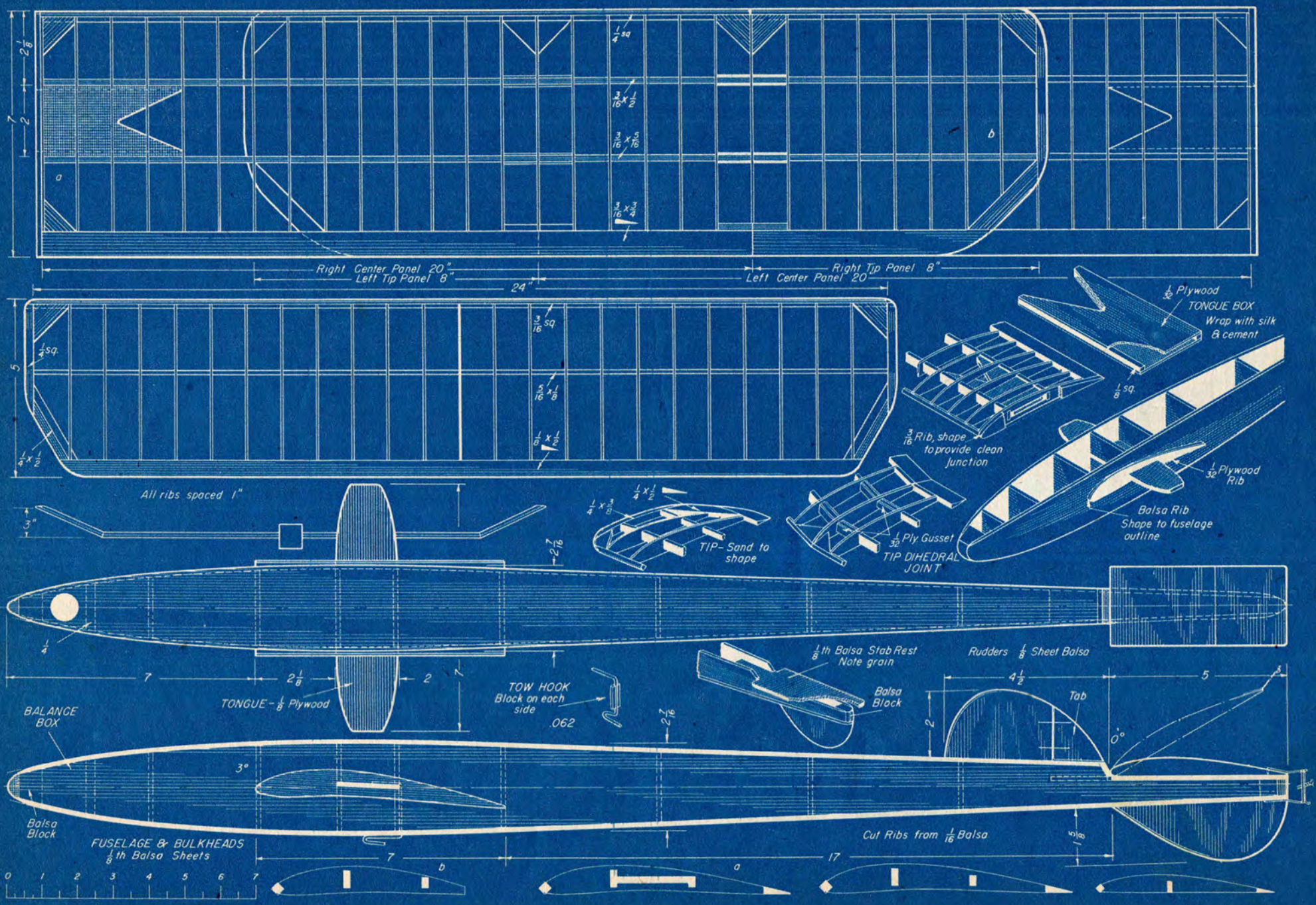
G. Polyhedral stab t.l. has 6 deg. angular difference between 84 in. span wing and 44.4 in. stab. Crutch construction, sub rudder. Triangular, 59.5 in. fuselage. NACA 4612 wing; 620 sq. in.
—George Perryman, West Point, Ga.

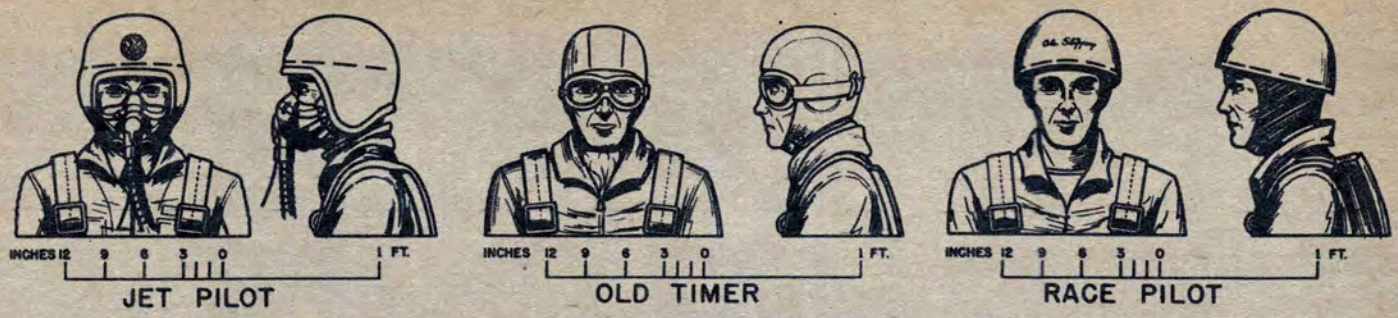
H. Warren truss fuselage, 33 in., covered with 1/8 sheet balsa. V tail. Needle nose spinner; bolt holding spinner also carries washers for balance. Span is 54 inches. Trim tab at end of fuselage.
—Kenneth Pruitt, Lubbock, Tex.

H



G


Right Center Panel 20"
Left Tip Panel 8"
24"
Right Tip Panel 8"
Left Center Panel 20"
All ribs spaced 1"
TIP- Sand to shape
TIP DIHEDRAL JOINT
Plywood TONGUE BOX
Wrap with silk & cement
Rib, shape to provide clean junction
Plywood Rib
Balsa Rib
Shape to fuselage outline
Ply. Gusset
TONGUE - Plywood
TOW HOOK
Block on each side
.062
BALANCE BOX
Balsa Block
th Balsa Stab Rest
Note grain
Balsa Block
Rudders Sheet Balsa
Tab
FUSELAGE & BULKHEADS
th Balsa Sheets
Cut Ribs from Balsa



carving a

Pilot's Head

It's easier than you think if you follow these 5 easy steps; any modeler can turn in a creditable figure

By AUBREY KOCHMAN

■ There is nothing that adds more realism to a model than a well-carved pilot seated in the cockpit. For those of you who are interested in team racing and contemplate entering any A.M.A. sanctioned meets for this event, a pilot is a must. The A.M.A. rules for team racers specifically state that these realistic models must have a pilot carved to 1/10 scale. However, it is not necessary that the pilot be a complete figure, but may consist of just the head and shoulders.

Carving a head is not as difficult as you might think. You don't have to be a Jo Davidson in order to turn out a figure only slightly better than some horrible gargoyle. Actually any modeler who's carved a fuselage or cowling has the basic knowledge necessary to carve a head, although greater care must be exercised in selecting a block of wood and keeping your knife razor sharp at all times.

An X-acto knife with a #11 blade is perfect for all fine detail carving. Choose a block of balsa that is even grained and smooth textured and one that is not hard on one side and soft on the other. A soft block, although easier to carve from a physical standpoint, requires greater care when you come to the carving of details, since the soft wood may crumble or break off. On the other hand, hard balsa is usually stringy and this type block is to be avoided as it is almost impossible to carve.

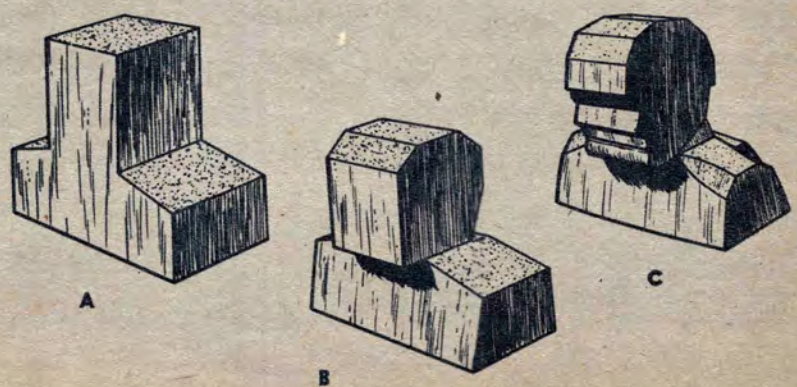
The basic rule to remember is to take small cuts and sort of "feel" your way along. Work oversize until the entire pilot is well shaped and then proceed to "carve down" to proper size. Five stages in carving are illustrated. The first stage shows the block with its primary cuts. Then the head is rounded fore and aft and the chest cut in below the chin. Next a few more slices and the face in side view begins to take form. Now the rounding operation begins. Here the rule is small chips, no big gashing slices. And the final step finds your pilot with a well-sanded helmet and finished face, ready for painting.

The finished head is carefully sanded and then the details such as the wrinkles at the corner of the eyes and mouth are added. Brush on a coat of clear dope and again sand smooth. Use water colors to color the face and coveralls.

To stop the water color from "crawling" on the doped surface, add a little white soap such as Ivory to the paint.

HERE'S HOW YOU DO IT . . .

When you start remember that you're working to the largest outside dimensions (A) so the depth of your block should be slightly more than your pilot in side view. On the race pilot the helmet is the largest outside dimension to the front, therefore it is carved slightly oversized (B). The rim shape of the helmet is carved all the way down the head block. Next draw the shape of the helmet side view onto the block when you've reached stage (C), then rough down to approximate shape. Spot the nose and carve back the block allowing the nose to protrude (D). Work slowly.



SPORTSMAN PILOT

Helmet is the only part that should have a really smooth and shiny finish. Use two or three coats of sanding sealer, sand smooth and paint with colored dope. A very thin coat of clear dope should be brushed on the rest of the figure to "fix" the water colors. The parachute shoulder straps are cut from cloth and the buckles from thin cardboard.

The best way to obtain authentic coloring and correct head proportions is to keep a mirror handy and study your own head.

COLORING OF PILOTS' HEADS

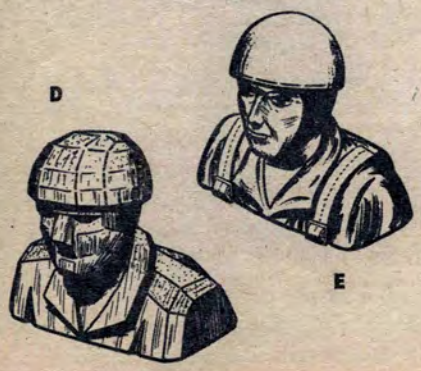
Old Timer. Helmet, brown or tan. Goggles, inner rim silver, outer rim light grey. Goggle strap, black or grey. Jacket collar, light tan, sheepskin color. Scarf, white. Jacket, dark brown.

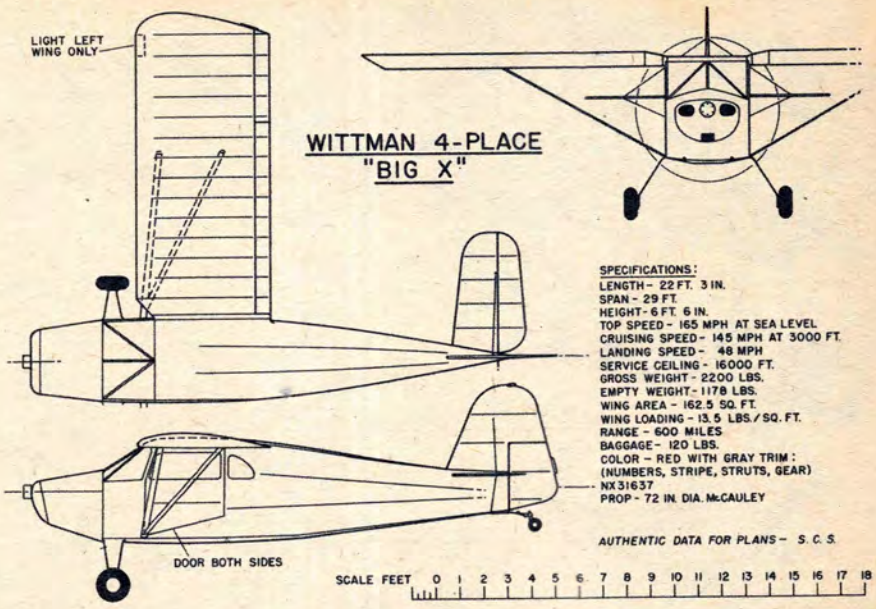
Sportsman Cap, suntan, white or red. Shirt, suntan or white. Jacket, dark brown or green or suntan coveralls. Headset, top straps brown, shiny metal hangers, earphones black, cord black.

Race Pilot. Crash helmet, white, red or gold. Lower helmet, brown or black. Tee shirt, white, red or green. Coveralls, suntan.

Jet Pilot. Lombard helmet, white with black bead along lower edge. Oxygen mask, green, see cover May 1950 Air Trails. G-suit, forest green.

Note: All parachute straps are white, buckles are aluminum finish and back pads and packs are khaki colored.

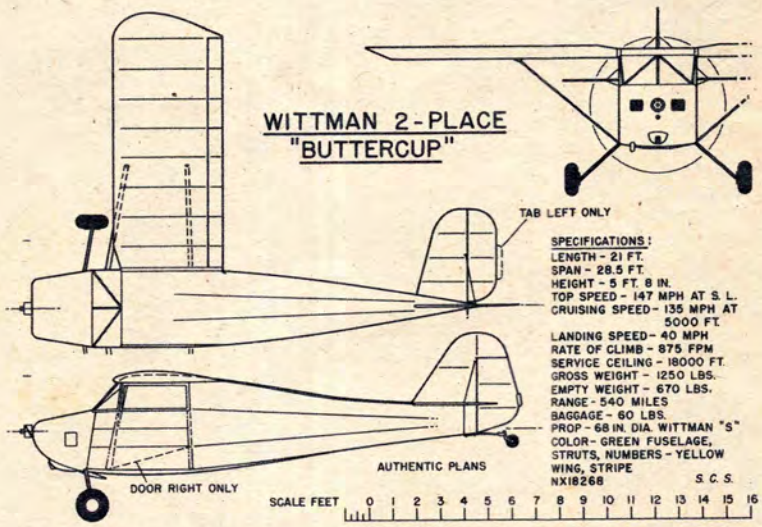




SPECIFICATIONS:
LENGTH - 22 FT. 3 IN.
SPAN - 29 FT.
HEIGHT - 6 FT. 6 IN.
TOP SPEED - 165 MPH AT SEA LEVEL
CRUISING SPEED - 145 MPH AT 3000 FT.
LANDING SPEED - 48 MPH
SERVICE CEILING - 16000 FT.
GROSS WEIGHT - 2200 LBS.
EMPTY WEIGHT - 1178 LBS.
WING AREA - 162.5 SQ. FT.
WING LOADING - 13.5 LBS./SQ. FT.
RANGE - 500 MILES
BAGGAGE - 120 LBS.
COLOR - RED WITH GRAY TRIM: (NUMBERS, STRIPE, STRUTS, GEAR)
NX31637
PROP - 72 IN. DIA. McCAULEY

AUTHENTIC DATA FOR PLANS - S. C. S.

■ The two airplanes shown here were designed and built under the direction of Steve Wittman, famous race pilot. The four place *Big X* is powered by a 150 hp Franklin; the two-place *Buttercup* has an 85 hp Continental engine. *Buttercup* was designed in 1937 and is fitted with a tube-type landing gear which is extremely light flexing in all directions.

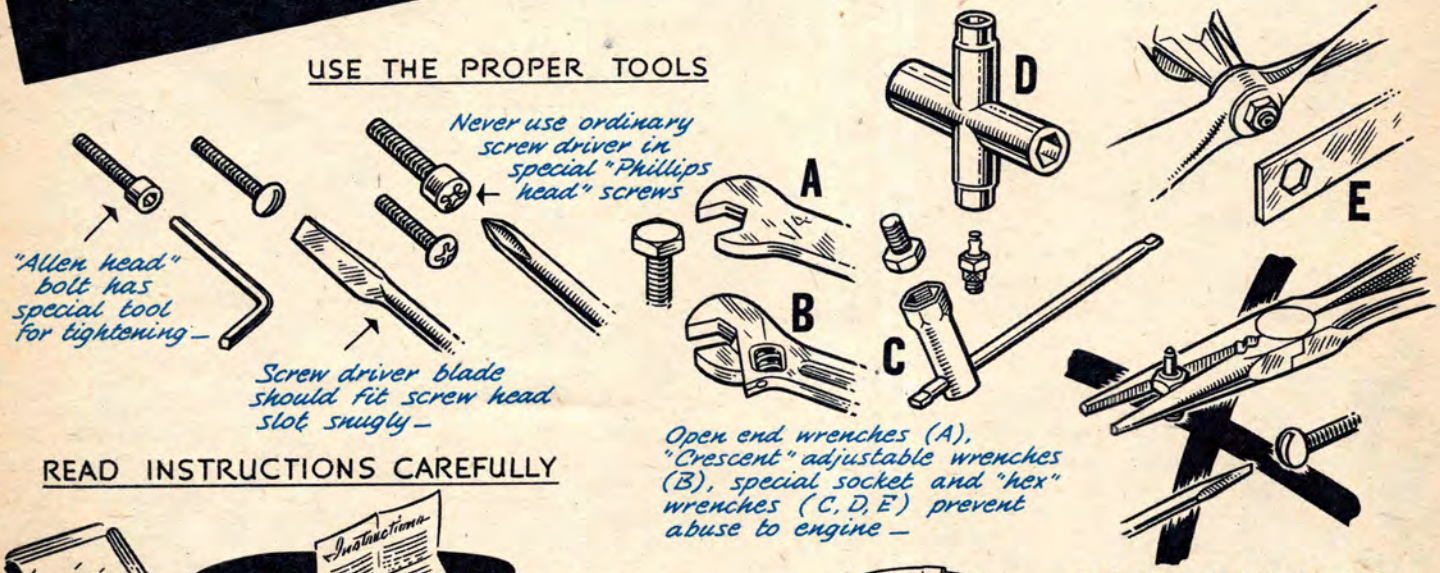


SPECIFICATIONS:
LENGTH - 21 FT.
SPAN - 28.5 FT.
HEIGHT - 5 FT. 8 IN.
TOP SPEED - 147 MPH AT S. L.
CRUISING SPEED - 135 MPH AT 5000 FT.
LANDING SPEED - 40 MPH
RATE OF CLIMB - 875 FPM
SERVICE CEILING - 18000 FT.
GROSS WEIGHT - 1250 LBS.
EMPTY WEIGHT - 670 LBS.
RANGE - 540 MILES
BAGGAGE - 60 LBS.
PROP - 68 IN. DIA. WITTMAN "S"
COLOR - GREEN FUSELAGE, STRUTS, NUMBERS - YELLOW WING, STRIPE
NX18268
S. C. S.

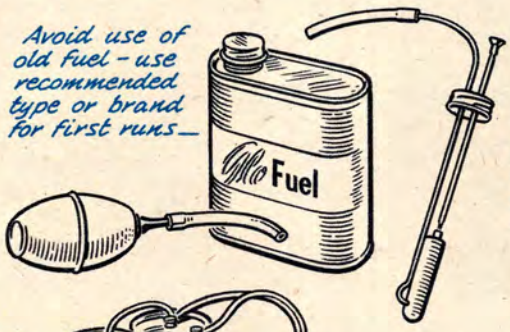
■ Wittman has his lightplanes serve as accessory trucks for the two midgets, Buster and Bonzo which are flown to and in racing events by Steve and Bill Brennand. Since different type props are used on the two racers in cross country travel than in the actual speed dashes, either *Buttercup* or the *Big X* carry the racing props, extra wheels, tools, spare parts.

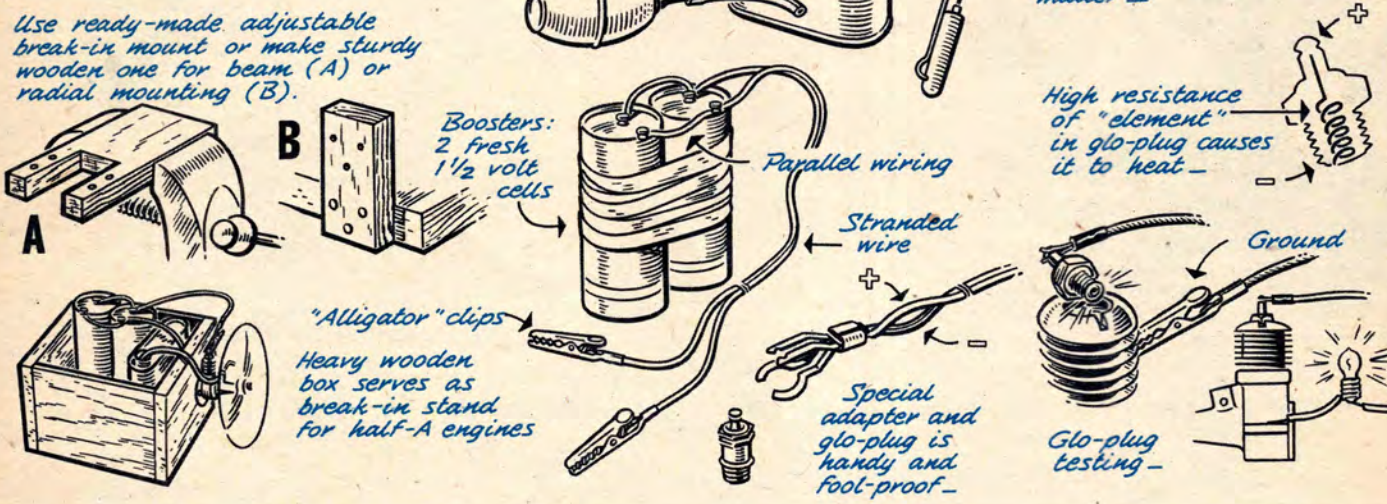
Elementary Modeling: Model Engines

USE THE PROPER TOOLS



READ INSTRUCTIONS CAREFULLY

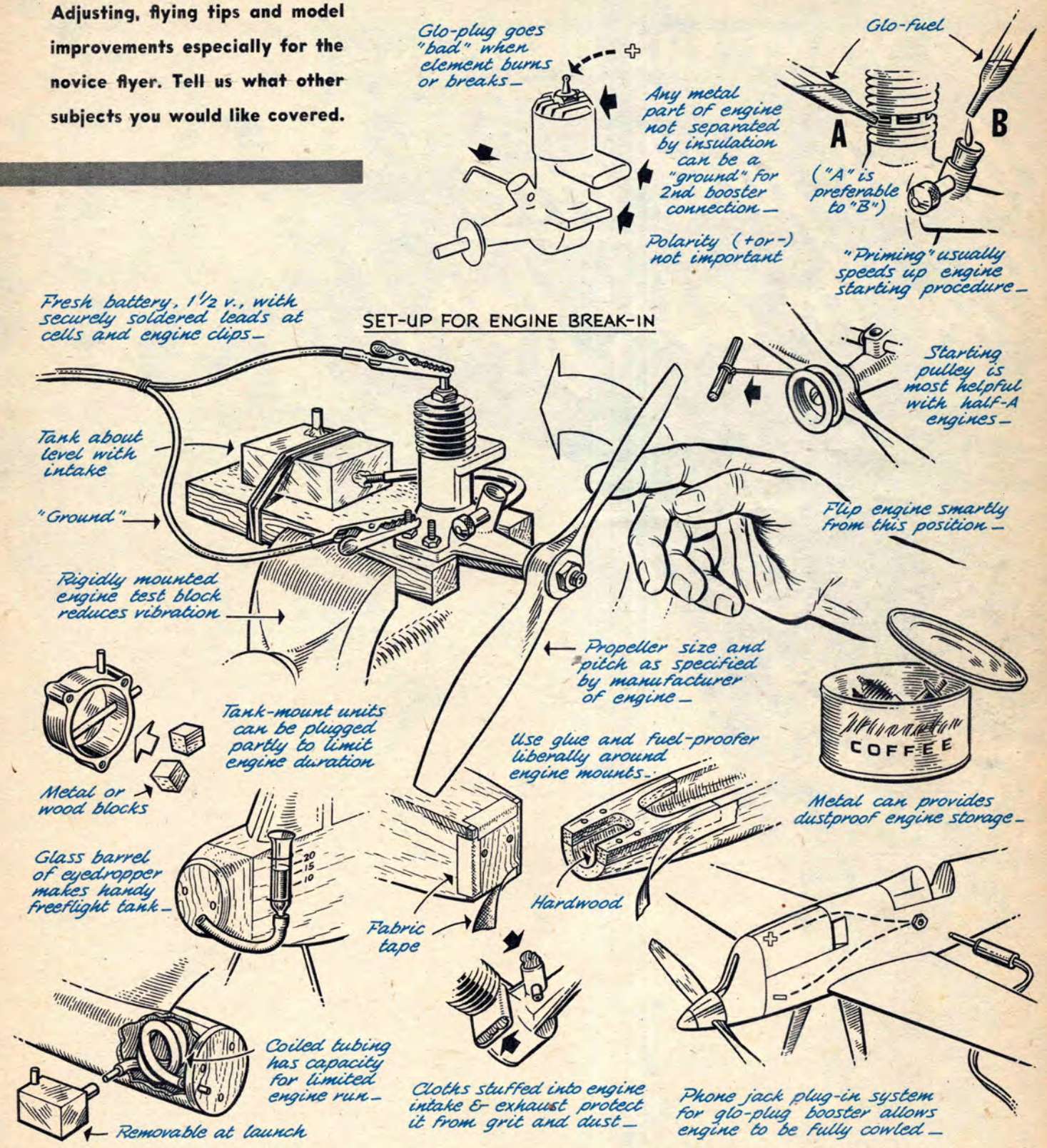




The new modeler should remember that his engine is a piece of precision apparatus fitted to amazingly close tolerances. He should thoroughly familiarize himself with the manufacturer's instructions as to its operation, never weighing his own judgment against that of engine's builders. He is smart if he invests in the few tools necessary to service engine properly rather than subjecting it to possible abuse by using improper or makeshift tools. Parts bolted or screwed together should be tightened evenly and snugly, preferably after running engine. *Never disassemble engine unless it is absolutely necessary.*

Length of engine's life and performance both hinge on type and amount of lubricant supplied to moving parts. Model engines of two-stroke cycle type carry lubricant mixed with fuel, oil being forced by compression to all points needing lubrication. Castor oil, a fine lubricant, is usually employed in ready-mixed glow-fuels, additional castor oil often being used during break-in period. However, if engine shows no tendency to "freeze" (tolerances reducing through heat expansion until engine slows or stops), no additional oil is needed if needle-valve is left to rich setting. Rich settings mean slow running, smoke, a relatively cooler engine; lean

Adjusting, flying tips and model improvements especially for the novice flyer. Tell us what other subjects you would like covered.



settings give greatest speeds and most heat.

Glow-plugs are heated by batteries for starting, then continue to glow and provide ignition by heat of combustion. Check condition of plug by light bulb wired into starting battery circuit, or remove plug, connect batteries and check glow. Sometimes reflected glow can be observed through exhaust port without removing plug, thus assuring glow-plug is O.K. After starting, wait until engine is adjusted for smooth running before disconnecting booster.

If engine runs smoothly without overheating, little break-in is necessary. If it overheats, make numerous short runs or add more castor to fuel, or drop small quantities in intake while engine is running; continue until engine loosens. Cover intake and exhaust ports to keep out foreign matter between runs. If engine lands in dirt, remove plug, flush thoroughly in gasoline, then lubricate.

If glow-plug checks O.K. and fuel reaches intake, engine should start after priming. If too lean, it may make short, fast bursts; if too rich, will run sluggishly and smoke. Go easy on priming in exhaust or intake—only a drop or so at a time. Flip prop smartly, having it positioned on shaft for easiest cranking.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15¢ AND 25¢
JARS
TESTORS
DOPE
SILVER
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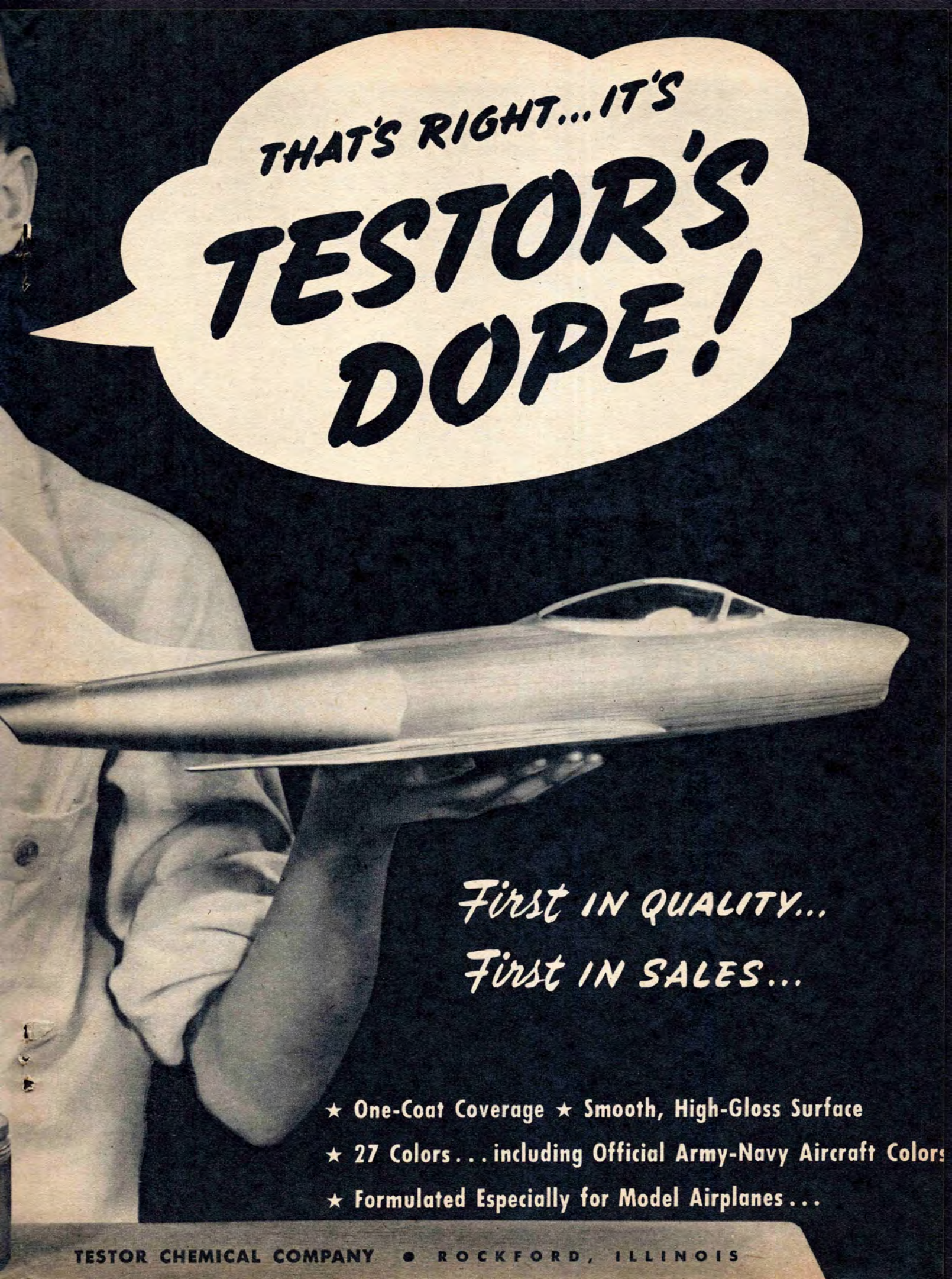
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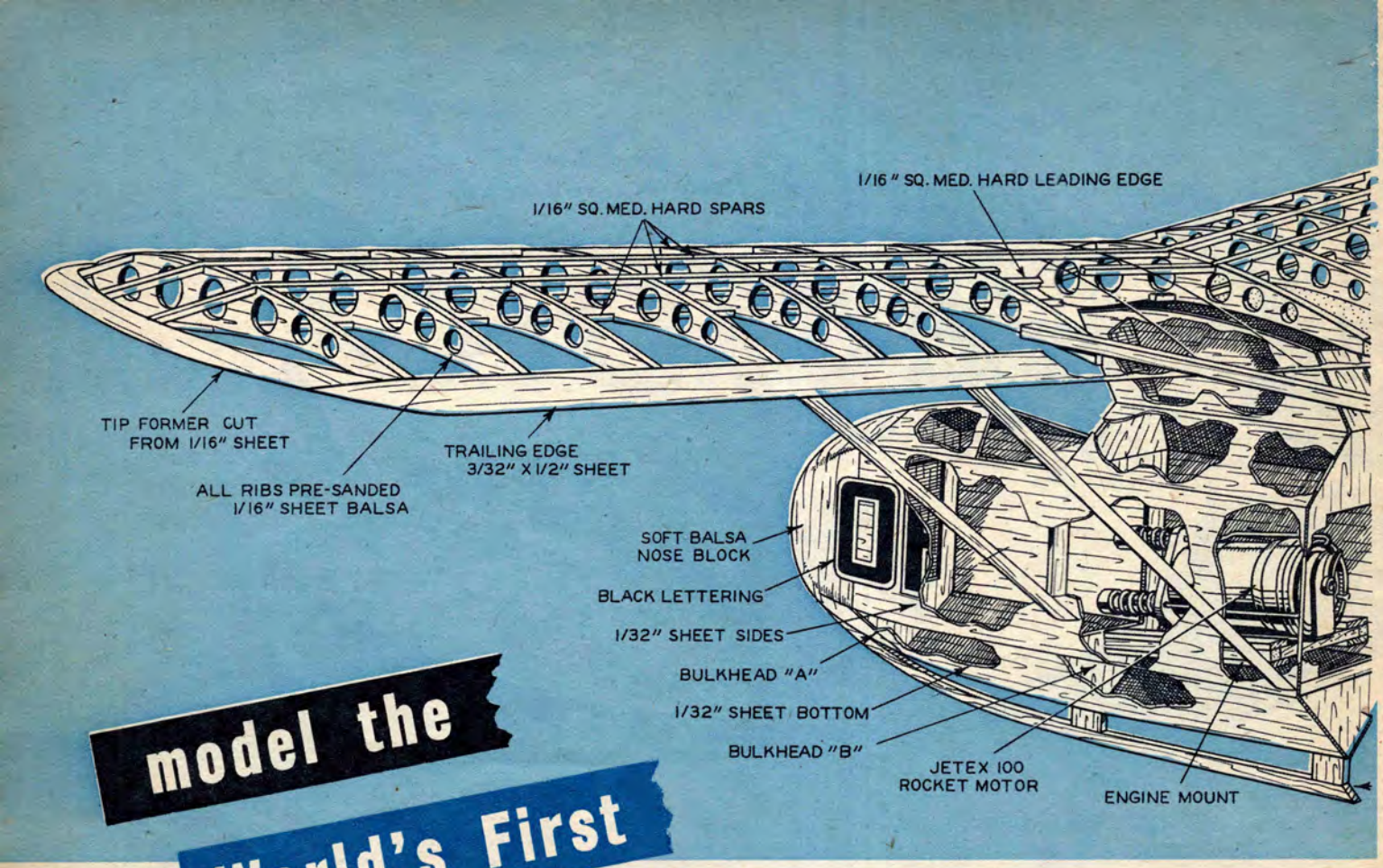


model the World's First ROCKET PLANE

This "milestone" plane makes a perfect flying scale model with its own tiny Jetex rocket engine

By WALTER A. MUSCIANO

■ It was only a short twenty-two years ago that a reaction-propelled, man-carrying aircraft was but a dream. Then Fritz von Opel and two brilliant associates demonstrated the world's first successful airplane propelled in such manner.

Professor Sander designed the rocket engine which consisted of five rocket tubes fired successively to prolong the flight. If fired simultaneously the engine would have developed enough power to lift 6,600 pounds. Engines of similar design had been tested in race cars built by Opel, a famous automobile manufacturer. When ground tests proved successful the designers decided to attempt rocket-powered flight. They engaged Ernest Hatry to fashion a wheelless airplane that could accommodate their engine. This was the trio responsible for the world's first successful reaction-engine-powered, man-carrying aircraft.

Our free flight model has same type powerplant as the full scale prototype, a solid fuel rocket. A "Jetex 100" engine developed more than enough power to attain reasonable altitudes for some sensational gliding. Best time we made was just under eight minutes.

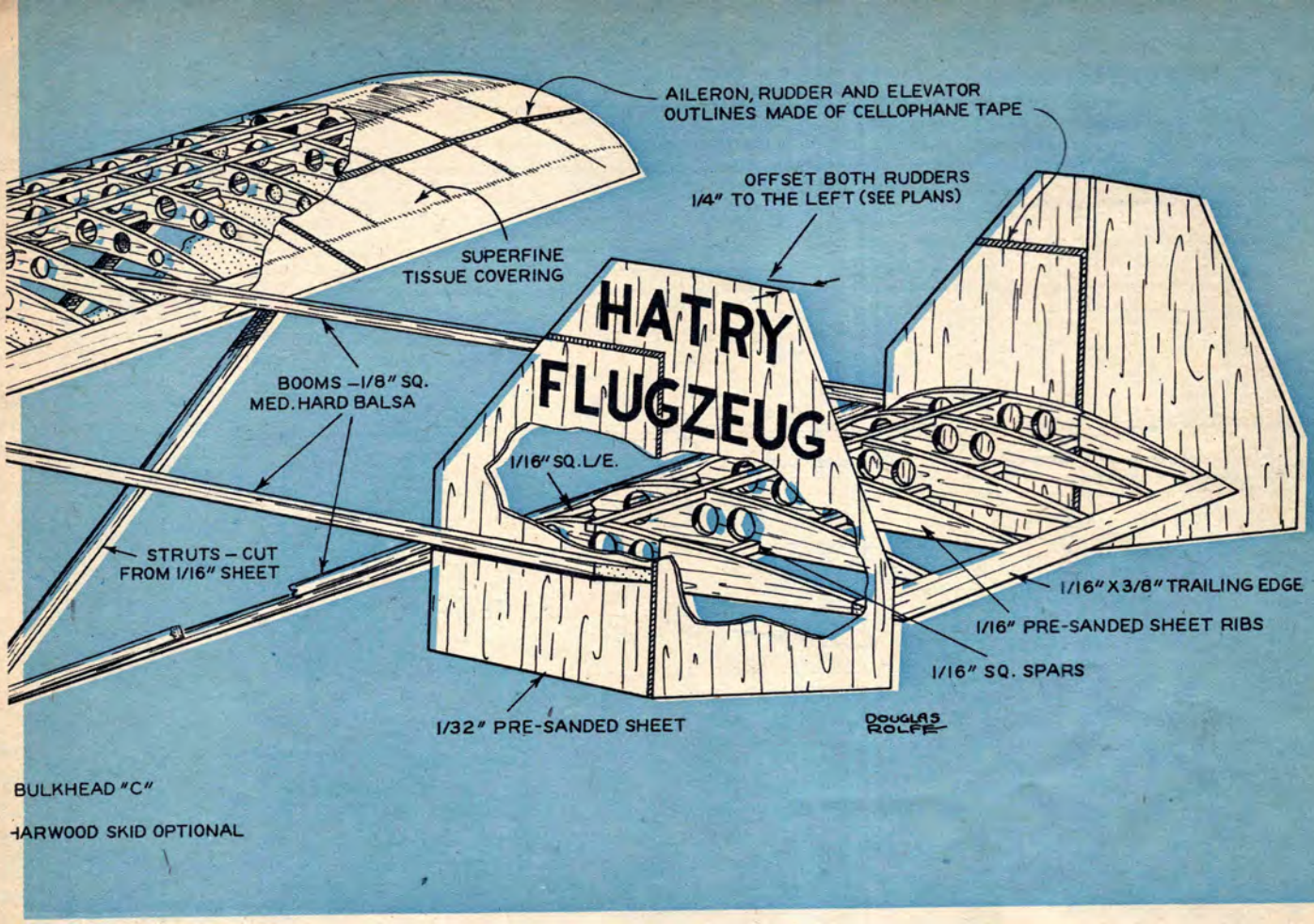
A model three-fourths the size of ours should work well with the "Jetex 50" if constructed with care to insure a very light craft. A half-size model should go like blazes.

All-balsa construction is utilized in fuselage and fins, while wing and stabilizer are multispar framework with tissue covering. Begin by cutting basic fuselage pod sides. Cement bulkheads between these sides. Cover Vee bottom. Install engine mount balsa runners at proper thrust angle shown on side view of plan.

Should any thrust line alteration later become necessary, insert shims of sheet asbestos (supplied with the engine) between balsa mount platform and aluminum engine clip at the front or rear bolt connection. Balsa mount platform must fit the bearers quite snugly, and is held in place by a friction fit. It is removed with the rocket engine for recharging. Nose piece is solid because we required the weight in nose to obtain correct static balance.

All wing ribs are identical and cut from rather soft sheet balsa. Cover wing with finest tissue available. Use clear dope as the adhesive, and when watering tissue be certain to pin wing to a flat surface to prevent any warps from forming. While pinned, two thin coats of clear dope can be applied, one panel at a time.

The stabilizer is constructed in a similar manner as wing. Also, it is covered in same way. Rudders are cut from medium sheet balsa and sanded. All strut material should be



sanded smooth. Slit top wing tissue covering, smear cement on strut end and attach struts at proper angle. Cement them to the wing structure, not just to the tissue. When this is dry, cement tail surfaces in place. Struts are flush with outside of the plate rudders. Cement wing to fuselage-pod. Now remaining struts can be cemented in place.

To save as much weight as possible, fuselage was not doped; since we could not use decals on the bare wood surface, the large black letters "OPEL" were inked onto a sheet of gummed paper (package label) and stuck in place. The smaller lettering was drawn on a buff gummed label, then glued in place. Lettering on fin is same as fuselage. The colored strut and pod trim is red dope, thinned about 50 percent, applied sparingly.

Balance model at point indicated. The Jetex unit can be moved some to achieve this balance point. Should model be badly out of balance, use modeling clay in nose or tail.

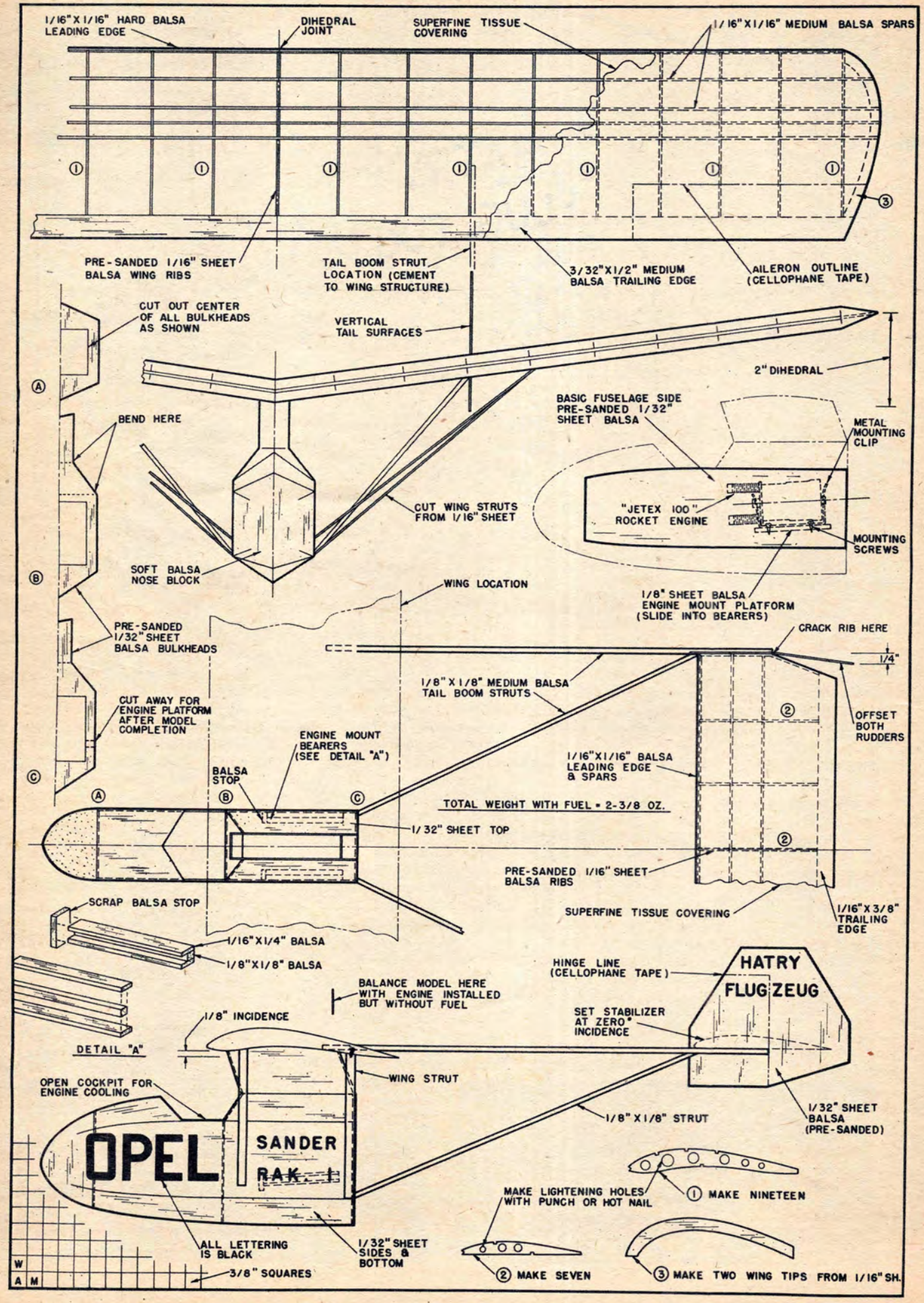
When gliding, release model from shoulder height with a gradual push, aiming at a point on the ground about 30 feet away. When glide is flat and to the left, you are ready for powered flight! Do not release model the moment the igniter wick is lit, but wait for a hissing sound. Launch as though you were test gliding. If model glides well yet seems to stall under power, a little more down thrust will correct this. Adjust model for circling because with balance point as shown it will stall if set for straight flight.

There are few scale models available which will produce such an effortless climb. With your Opel rocket plane properly adjusted, you will find that when power cuts there is no dipping, instead the model continues circling and begins a slow descent—an open invitation to any nearby thermal to come and get it. So have the glide just right first—flat and to the left.

Bill of Materials: 1 pc. 3/32" x ½" x 36", wing trailing edge. 1 pc. 1/32" x 2" x 36", fuselage pod, rudders. 1 pc. ⅛" x ⅛" x 36", boom struts. 1 pc. ⅛" x 2" x 2", rocket engine platform. 1 pc. 1/16" x 2" x 36", wing ribs, wingtips, wing struts, stabilizer ribs, stabilizer trailing edge. 5 pcs. 1/16" x 1/16" x 36", wing & stabilizer spars & leading edge. 1 pc. 2" x 1¼" x 2¼", nose block. 2 oz. clear dope. Small tube Testor's Formula "B" cement. Small piece very fine sandpaper. 1 sheet fine tissue. 1 Jetex 100 Rocket Engine.

Fritz von Opel is airborne from the take-off track with his rocket-powered craft on Sept. 30, 1929 at Frankfort on Main, Germany. Speed, 94 mph at 50-ft. altitude; total all-up weight, 770 lbs.

MODEL ROCKET PLANE



MODEL MATTERS

WESTERN ROUNDUP

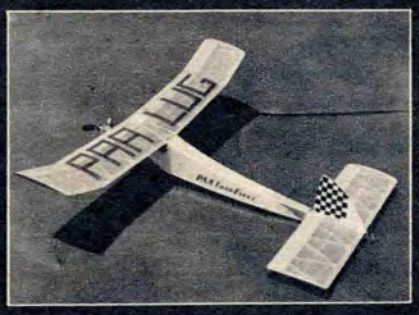
■ It seems that once in a blue moon a model builder comes along who excels in his field. When this fellow applies engineering theory to practice and makes it pan out, an even rarer event occurs. Such a man is A. G. "Red" Everitt of National City, Calif. He's built a total of five models, his first being the Korda Wakefield which he flew with dry rubber, not knowing what rubber lube was.

Today he is such a perfectionist that his latest ship of original design which he calls *3:5*, totaled over two minutes more than his nearest competitor in winning the Wakefield eliminations at Los Angeles, and topping all entrants in the Western states.

His winning ship is very unorthodox, his theory being that to get a ship to do maximum time you have to have a 3 to 5 ratio of bare model weight to power. When this has been accomplished through very careful design and building, you must put on an efficient prop that will get your ship up high, over 450 feet, on a prop run of 1:40 to 1:50.

Starting on this basis he proceeded to lay out a ship to use a maximum possible rubber length. Running the motor the full length of the ship seemed the easiest, lightest way of accomplishing this. To cut down wetted area the fuselage was made a diamond of fairly small cross section, a bump being added, *à la* "Jaguar" for the needed cross section. The horizontal tail was plugged into the sides and is removable. The top longeron was cut away to allow the top contour of the wing to fit flush with the top of the fuse. To cut down drag the wing had a paper fairing and the prop a plastic spinner.

The prop and its fittings were a source of considerable work and experimenting. The prop is removable through a pawl which screws onto the threaded music wire shaft. The prop has a self-locking stop invented by Red, which utilizes every wind in the motor. The prop design is entirely his own, (*Continued on page* 76)



Nat Antonioli built this Half-A PAA-Load "Paalug"; the Wasp-powered Calif. job has diagonal ribs with gussets; wt. 8.5 oz.

Red Everitt and his famous "Three: Five" Wakefield. Rubber runs full length of fuselage, 14 strands. Does over 5 min.

Free flight pusher powered by .074 Cub made by Bill Fileccia, Detroit. Has been flight tested successfully. Light blue.

Tiger Moth with Arden .099 has 20 in. span; does 50 mph on 40 ft. lines. Ken Clark and Lance Tanner, B.C., Canada.

DOPE CAN

■ From out of Detroit comes quite a blast by a well-known model club concerning the National competition towards which many of us will be heading within a few days. The *Detroit Balsa Bugs* have hung up an enviable contest record. Not long ago over the signatures of their president, Art Jasion, and secretary, Charles Bienenstein, an open letter went out to many clubs and meet directors.

"Members . . . have consistently attended the Nationals in the past," goes the letter in part, "and feel we can speak from experience when we say that last year's meet had many shortcomings. A few of them . . . contest procedure was very disorganized. Processing models to rules was lax. Flying terrain was poorly chosen, with the presence of a lake nearby and surrounded by snake-infested swamps. Being in a military base, flyers were subjected to military restrictions and regulations. Naval personnel did not have the proper experience to handle processing and timing."

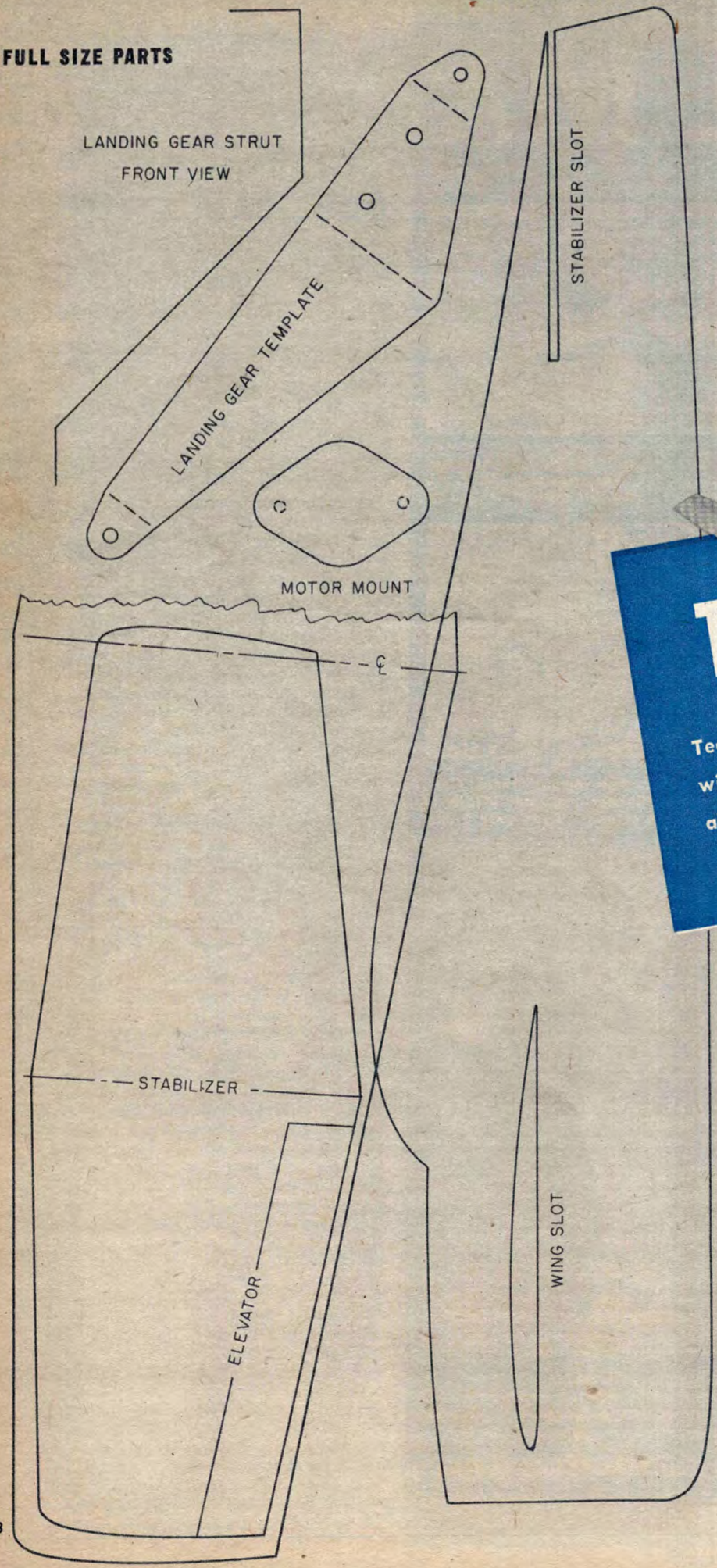
If you know the answers to some of these gripes, hold everything.

"We do not have any personal complaints against the Navy," continues the communication, "but we cannot see ourselves tied to them for the next five years. . . . Do you want a 'body' taking over the Nationals? We are headed in that direction. What can we do? Our idea of a sponsor is one who is generous with an open purse for which he receives all due credit and publicity; BUT, he does not tell us how, when, or where!

"The A.M.A. is adequately organized and has enough experience so that they can run the meet according to established rules . . . they should know that as dues-paying members, flyers expect a well-organized meet. We expect it to be run off as planned and scheduled to suit all model flyers. We expect a well-chosen terrain that is favorable to chasing models. We expect processing rules to be adhered to and events run on schedule. We don't want separate events in different locations on the same day. We expect competent help all (*Continued on page* 77)

News, Views, Comments and Photos from Model Clubs and Enthusiasts in America and overseas. Air Trails Pays $5 for Exclusive Pictures Used Here. (Sorry, we are unable to return submissions.)

FULL SIZE PARTS



■ With this "minature" model you can enjoy all the thrills of team racing. And best of all the "Tiny Tim" racer can be built in an evening.

A very special feature is the provision for flying the model as a conventional U-control craft, or it can be operated without a pilot from an indoor or backyard "pylon" as a tethered flyer.

Tiny Tim

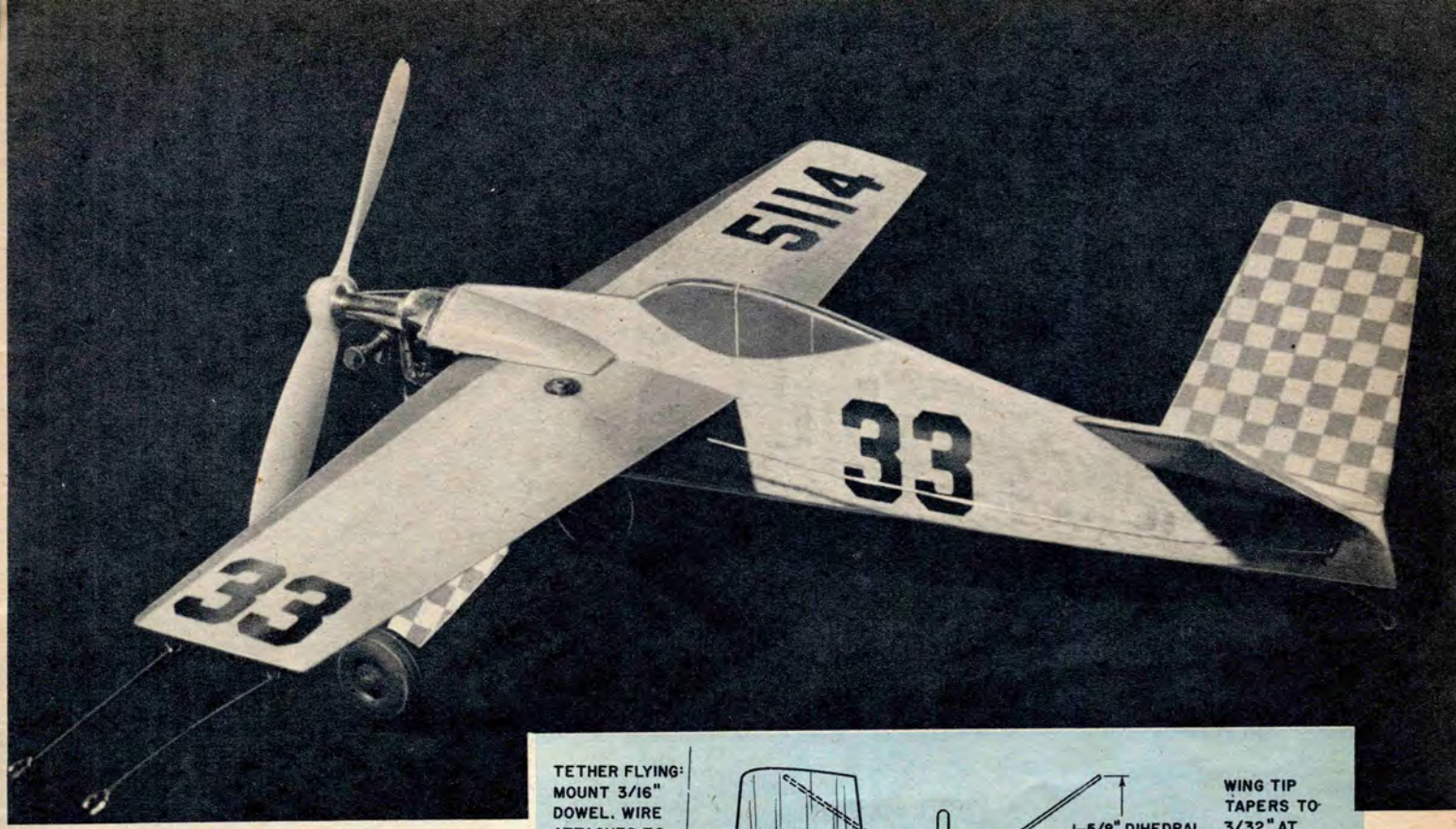
Team racing on a reduced scale will offer plenty of fun; you can also fly him round-the-pylon

By FRANK EHLING

Flying team-type competition from the center of the circle will provide just as much fun as though you and your buddies were operating "big" .19 or .29 powered planes.

The model, which requires very little balsa, is best started by cutting out the wood parts using the full-size forms as your guide. Sand the fuselage sides and edges, then cut out the slots for wing and stabilizer. Cut the plywood motor mount, glue in place, add the fairing blocks. The dural gear is cut out, bent to shape, drilled and bolted in place. Notice how it serves to hold the wing and fuselage together.

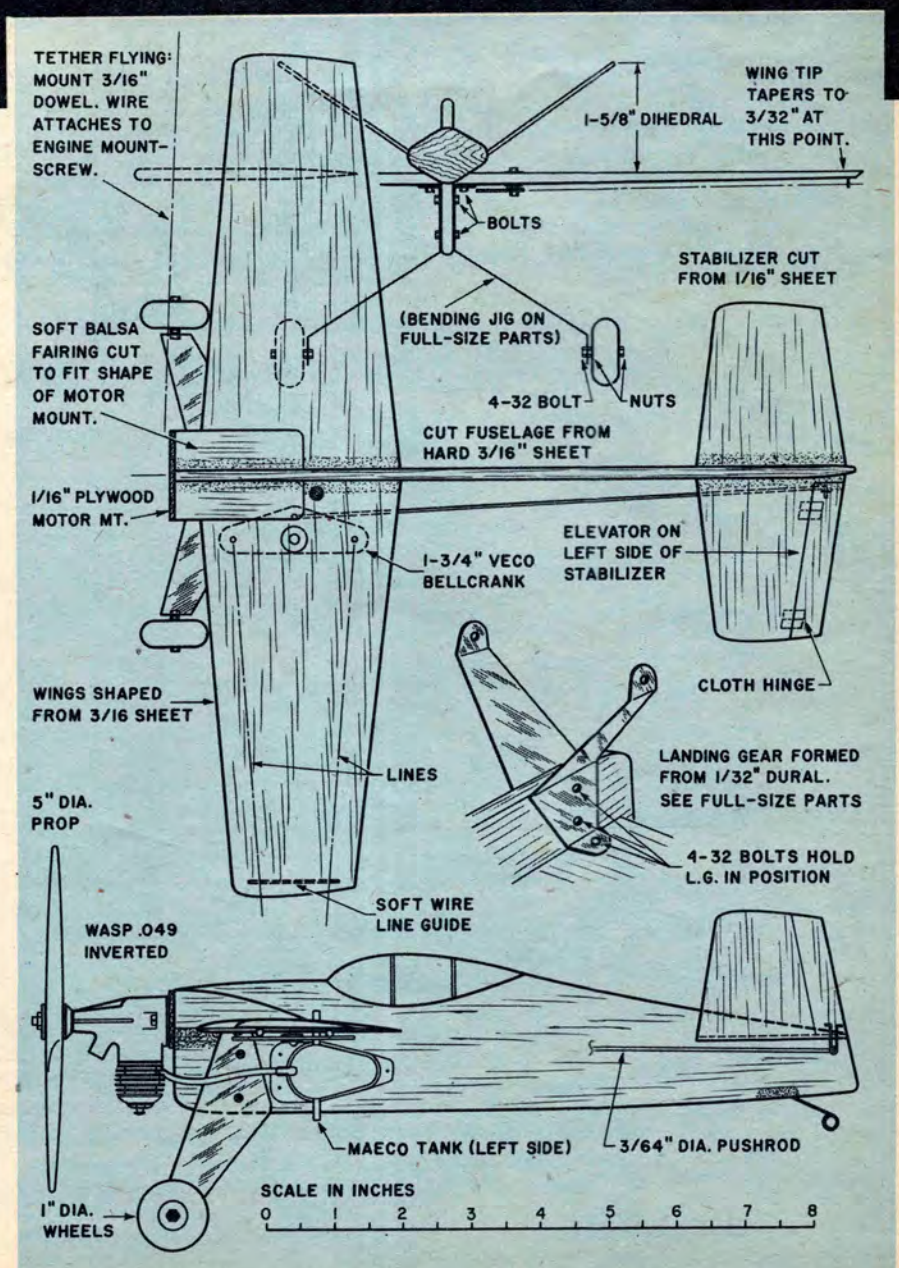
Next comes the wing. Sand to the airfoil shape shown and cement in place accurately. The



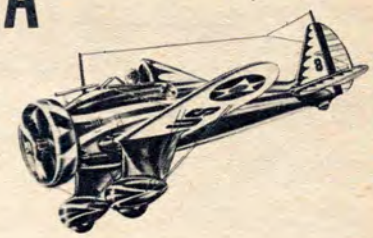
stabilizer follows; if you are going to fly Tiny Tim as a U-control job, then you'll cut out the elevator and add the hinges, along with the bellcrank, push rod, lead-out lines and elevator horn. For around-the-pole operation you'll need the right wing dowel guide which has a hole in it to permit the tether line to be attached to the engine mount screw.

To keep weight down the model is not painted, although it can be doped several times. Sandpaper the entire model between coats. If you want color on the ship, you can use a dye, then clear dope. Trim-Film will give some zip to the lines. Try this method: apply the Trim-Film and while it is still damp, spray on fuel proofer lightly. This "welds" the Film to the wood.

When you operate the model as a pole flyer, be certain the pylon pole is securely anchored to its base and the base is heavy enough to take the pull that will develop from flying the craft on a 10-foot line. Just start the engine and let the model take off by itself which it will do after a short run. As the engine leans out the model will climb until it is flying at the same height as anchor point on pylon.



Model of the Month—Cleveland's P-26A



America's first low-wing fighter returns as a fine pre-fabbed scale job by a pioneering model concern

■ As far back as we can remember, Cleveland Model and Supply Company has specialized in exact scale models. In the old days when you built a Cleveland scale ship you really *worked* to do it, but the results were always worth the effort, for this manufacturer has always stuck closely to realism. If a design called for all sorts of intricate curves and details, they would be found faithfully duplicated in the kit plans.

Upon opening the P-26A kit box, we felt just about as we did when opening a Cleveland kit in the old days—a bit speechless. There was the same profusion of parts, the multitude of sticks, sheets, pieces of wire, and just as in the old days, those same beautifully drawn plans. This firm has always been noted for its fine plans—there was, and probably still is, many a modeler's home workshop "papered" with Cleveland plans. And it seems likely that the P-26A plan will also go on a lot of walls.

There is a big difference between this C-D kit (Cleveland-Designed for you youngsters who never heard the term before) and those older ones, though. It is evident in those nine sheets of die-cut balsa, formed landing gear wire, shaped and hollowed wheel covers, and other modern prefab details.

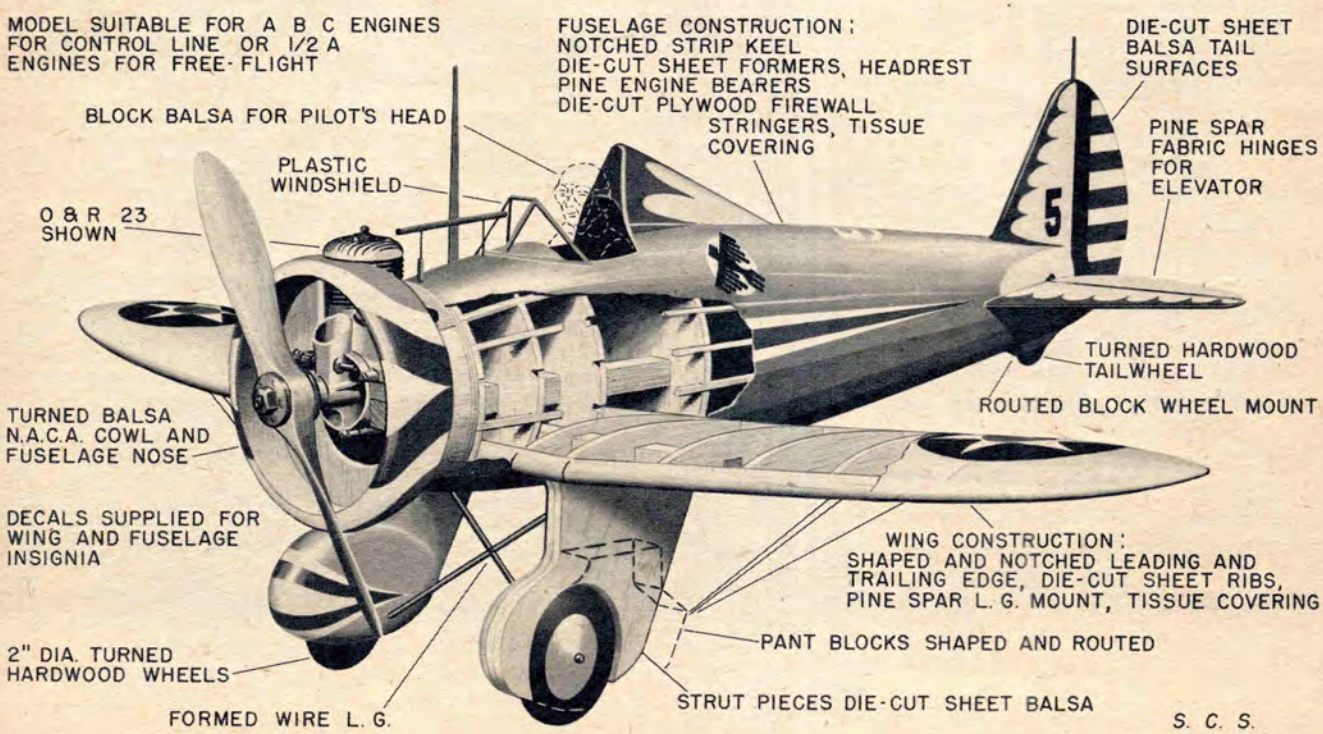
As usual, when a new kit comes along, we spent a lot of time studying the plans and checking size, shape and fit of all parts. "Shaped, spun, routed, notched, or die-cut parts" the ad says; we could add "turned, formed, printed, and so on," for all these processes are necessary to produce a kit of this quality.

Cleveland has always felt that a model builder would take more pride in his finished job if he really had to work to produce it. President Ed Pachasa still thinks this is so, and while the P-26A and companion prefabbed Great Lakes bipe kits are very well prefabbed, there is still enough detail work left so that the builder who finishes one of these ships will be able to state proudly that he *built* the model, not just that he assembled it.

You are given shaped and notched leading and trailing wing edges, die-cut ribs and tips, and a center spar of hardwood routed out for the landing gear wire. The P-26A is flyable either as a controliner or for free flight. The line version of the model uses the ribs just as they come to make a symmetrical wing cross section. If you pick free flight, you trim off the bottom of the ribs and change the angle of the trailing edge to produce a flat-bottom airfoil of good free flight characteristics.

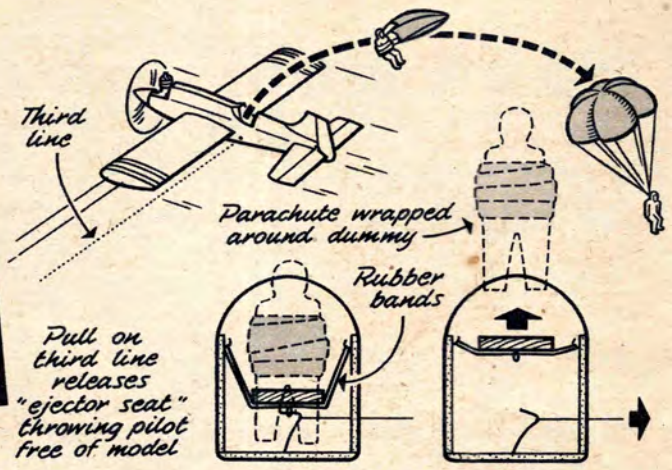
The fuselage bulkheads are die-cut in halves and fit over the central fuselage spar. Bulkhead notches are made easy by the use of a long strip of ⅛" wide sandpaper and a piece of ⅛" thick hardwood. Cement these together and just "sand" the notches in the bulkheads. This is simple, accurate, and rapid, and we predict modelers will keep this little tool for future use on other projects. If you want a free flight ship, the wing incidence angle will be different from that used for control flying.

The kit includes drilled and hollowed wheel cover halves and sturdy hardwood wheels. The tail wheel is also housed in a covering, for which hollowed halves are furnished. The plywood firewall is completely shaped, beveled and with cutouts for motor mounts; the tail surfaces are of sheet balsa. The latter are cemented permanently together for free flight use, or you can offset the rudder, hinge the elevators and install a (*Continued on page 72*)

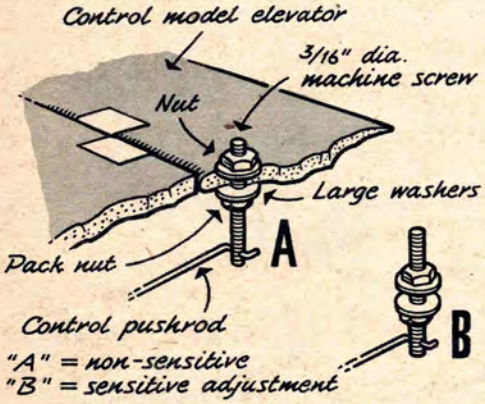


sketchbook

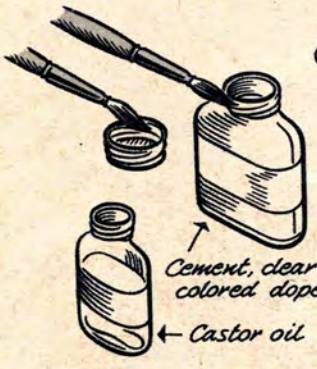
Have you developed something new in construction, control, or flying that might interest other modelers? Send a rough sketch—we'll redraw it and pay $5 for each one accepted. Due to their large number, we're sorry that we cannot acknowledge or return submissions.



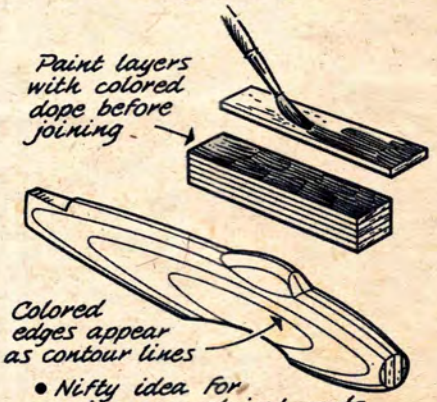
• "Ejector seat" for dummy pilot comes from Don Smith, Rochester, N.H., (adaptable to freeflight using timer)



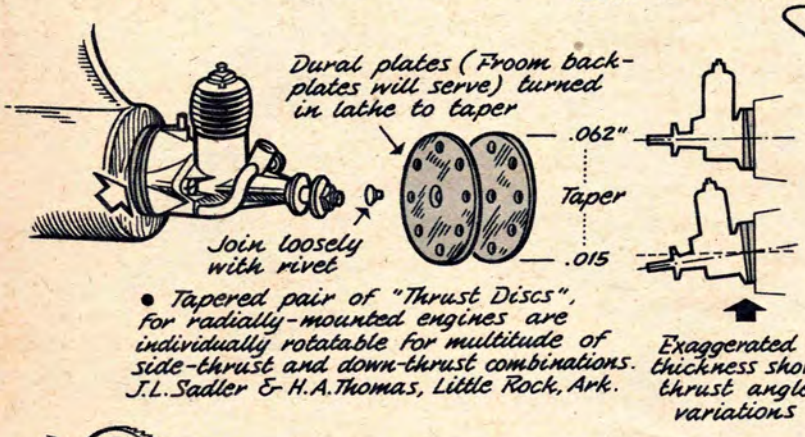
• Dependable elevator "horn" with quick adjustment to vary sensitivity submitted by: Duane Borden, Ponca City, Okla.



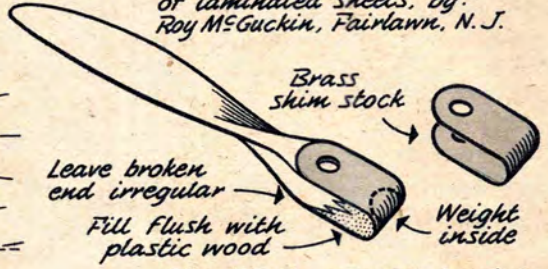
• Clarence Mather, Lexington, Ill., prevents dope & cement lids sticking by brushing castor oil on lid threads



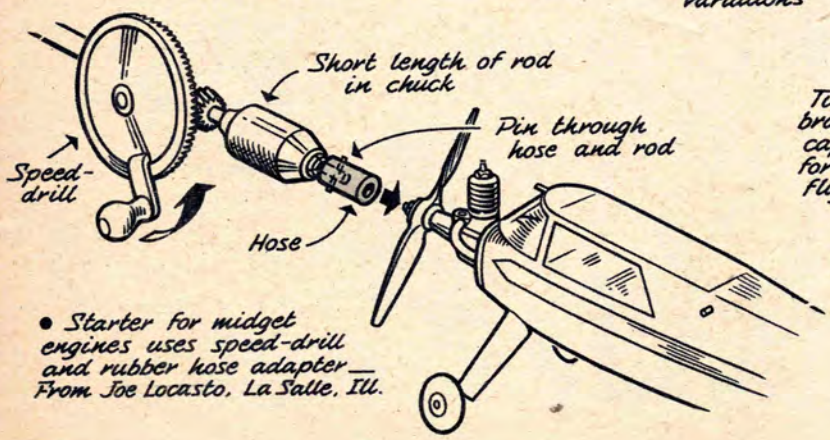
• Nifty idea for carving symmetrical parts of laminated sheets, by: Roy McGuckin, Fairlawn, N.J.



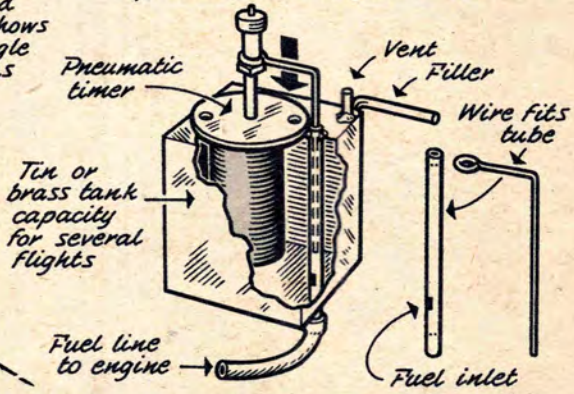
• Tapered pair of "Thrust Discs", for radially-mounted engines are individually rotatable for multitude of side-thrust and down-thrust combinations. J.L. Sadler & H.A. Thomas, Little Rock, Ark.



• Simplified counterbalancing makes broken propeller serviceable reports Bill Miller, Arcadia, Mo.



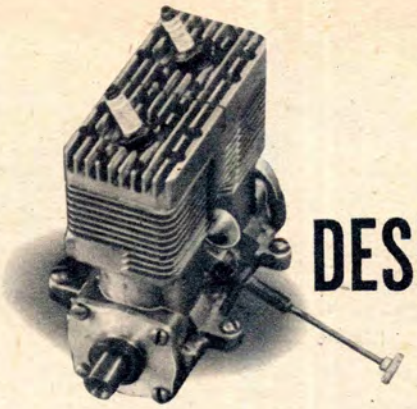
• Starter for midget engines uses speed-drill and rubber hose adapter— From Joe Locasto, La Salle, Ill.



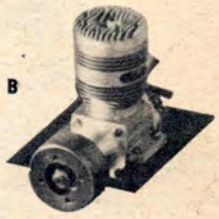
• Multiple flight timer-tank is invention of Bob Sutton, Topeka, Kan. Plunger cuts fuel flow to engine—

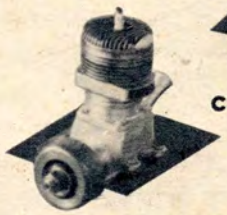
Motor of the Month

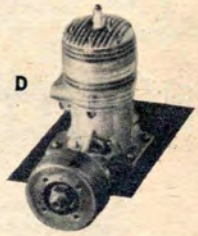
EXPERIMENTAL DESIGN

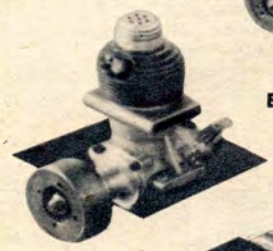


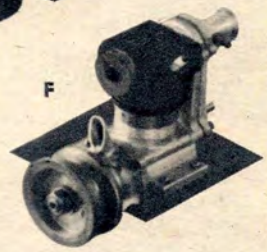
Even though you can identify every modern make of model engine you'd have a tough time with this unique collection built by Dooling Brothers

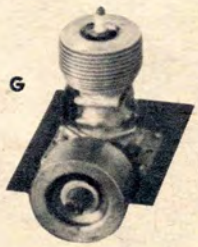












■ Four men worked two years and spent over $50,000 to develop one good model engine.

It all began back in 1936 when Tom Dooling Jr. paid a neighbor five dollars for a box of miniature engine parts. He made six or seven model airplanes for the motor but always broke them. One day in desperation he put the motor on a board, hung on a set of wheels, and made a gas model car.

Fate, in the form of film actor Reginald Denny, stepped into the picture. Mr. Denny saw this original car and asked young Dooling to make 25 cars for his Hollywood model shop. At that time Mr. Denny was building his own engines.

Tom Dooling Jr. combined resources with his father Tom Sr., his brothers Russell and Harris, and the Dooling Brothers Manufacturing Company came into being.

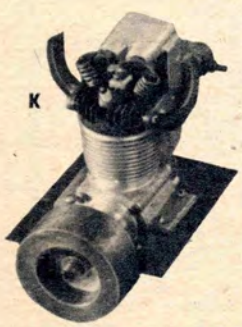
Their first machine shop was in the garage in back of the modest Dooling residence. After the first order of 25 cars was delivered, Mr. Denny promptly ordered 25 more. Before the war changed their product, the Doolings had built over 25,000 model cars. A vacant lot next door, 50 feet in diameter, became the first Los Angeles model racetrack.

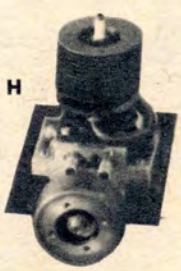
Came World War II and the Doolings went into military contracts. They did early experimental work on devices like the "bazooka" and top-secret Navy fuses. The Dooling shop worked directly for the scientists at the California Institute of Technology in Pasadena.

"If the scientists could draw it on paper, we could make it," said Tom Dooling Sr.

With the war's end, many small manufacturing shops went into the model engine business. A large percentage are now closed, but the Dooling engines are very much in evidence.

"We had a couple of good competitors, but we didn't want to copy their designs," reminisced Tom Dooling Sr. "We (*Continued on page* 54)





..CHOOSE TRIXTER FOR CONTROL LINE STUNT FLYING

designed by *Lou Andrew's*

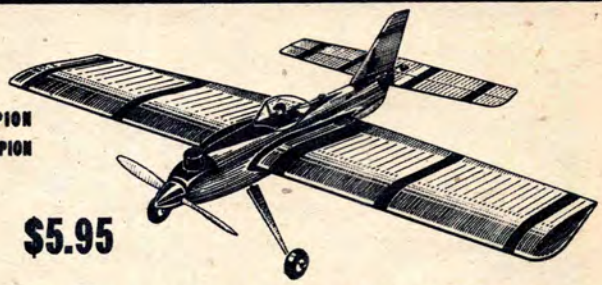
1950 NATIONAL OPEN STUNT CHAMPION
1948 INTERNATIONAL OPEN STUNT CHAMPION

$2.95

CLASS 1/2A

BABY BARNSTORMER

1/2 Size Version of Champion Barnstormer for 1/2A engines - 23½" wing span - 118 sq.in. Flies like a dream on 25' to 35' lines. Completely pre-fabricated. Will do full stunt pattern.



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DOUGLAS AD-1 SKYRAIDER

PAUL K. GUILLOW, WAKEFIELD, MASS.

Dooling

(*Continued from page* 52)

put four men on the project full time for two years. Our dynamometer, built specifically for model engines, cost over $3,000 alone."

After 15 years in the model engine business, one of the most popular exhibits at the Dooling Brothers shop is the group of experimental engines which led to the presently popular models that sell throughout the country. Here are some of the most interesting designs, described by R. F. Dooling:

(Top of pg. 50). This engine is an alternate firing two-cycle twin of 10 cc total displacement. Crankshaft is made in one piece suspended at each end on ball bearings. Lower ends of connecting rods are split, caps being held in place with two 2-56 bolts. Carburetor connects to crankshaft between cylinders and shaft here is cut with two openings, one leading to front crankcase and one to rear crankcase.

Ignition points are located at the rear end of the engine. There is one set of points for each cylinder operated on one cam. Both points being mounted on a bracket that advances and retards points so same will stay in synchronization. In operation this engine turned up about 20,000 rpm, which means 40,000 firings a minute . . . Bore, .719″ x .750″ stroke. Horsepower, 1¼ at 20,000 rpm.

(A). Two-stroke cycle engine, 1.015″ bore x .750″ stroke. This engine is a combination side port type and shaft rotary valve. The fuel and air are inducted into the rear of the engine, high on the cylinder and pass circumferentially around both sides of the cylinder and into the shaft rotary at the front. Ports open into the crankcase when the piston is near the top of its travel and the shaft rotary closes approximately 45 degrees after top dead center, the same time at which the piston closes the side ports. I can say that this engine has more induction valve area than any engine I ever saw for its size. It operated very nicely. However, we had difficulty in obtaining a proper seal in all the joints necessary in this type, and the side ports coupled with the shaft rotary apparently did not operate as well as fuel and air induction at a single point. One apparently disturbed the action of the other as the horsepower amounted to 1⅛ at 14,000 rpm.

(B). This engine is a peculiar one. We did not think much of the idea in the first place but decided to try it anyway. The piston is inverted, that is, turned upside down with lugs on the bottom to take the piston pin. Combustion takes place inside the piston. When same is at top dead center, a projection on the cylinder head reduces the volume to give the desired compression ratio. The interesting feature, which is the one that we thought might be advantageous, is the "straight-through" scavenging. The piston is a lapped type, no rings, and when at bottom dead center has two bypass ports 180 degrees apart at the bottom end, opening into passages from the crankcase.

The upper lip of the piston at the same time open two exhaust ports 180 degrees apart. The engine runs, but that is all. About 6,000 rpm is top due to two reasons, both of which are mechanical mistakes. One is that the piston wall which is thin, expands and "puts on the brakes" during combustion, and second, the piston pin hung below the piston proper causes excessive tipping of the piston (without crosshead). Bore, .937″ x .875″ stroke.

(C). A two-stroke cycle engine with a symmetrically domed piston, .940″ bore x .875″ stroke, dual bypass passages and dual exhaust with a large shaft type rotary valve and ignition points on the back side. This engine is similiar to some European motorcycle engines. It runs very nicely but . . . is inferior to the cross scavenge type with properly

(*Continued on page* 60)

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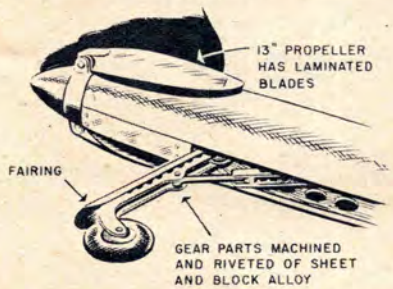
FOREIGN *News-Notes*

Jack Finneran, Sydney, New South Wales, packed a few models into his 8 hp Morris panel van, drove it 1,000 miles to the Australian National Model Meet at Melbourne, and returned a national champ! His original design Class B, Dooling 29-powered model placed first at 120, using 7/10 Tornado prop and 25% nitromethane fuel, bettering speeds chalked up in other classes (C-D combined, 117; A, 100 mph).

A Rudderbug equipped with British E-D radio gear was flown very successfully at the meet; another highlight was Jim Wilde's outstanding deHavilland Chipmunk flying scale job. Australian interests, model-wise, somewhat parallel our own with team racing, free flight and stunt flying all being



avidly pursued. National meet included speed category for Half-A jobs. American engines and accessories are evidently not too difficult for persevering modelers to acquire.

Jugoslav Modeler Dorde Zigic holds records with original free flight design reflecting Shulman influence right down to Drone diesel powerplant. Ship is five-footer, beautifully streamlined with retracting single leg gear and folding propeller. Same mechanical photo timer trips gear to retract after seven seconds, then cuts engine run after additional interval. Detailed plans indicate that tailplane is rigged to greater incidence than wing—plus seven degrees in stab, plus 3½ degrees in wing. Must surely call for superhuman skill in adjusting. Model, however, has rung up records of 37½ miles distance, height of 4,740 ft., and power duration ratio of 19.58. Ratios, incidentally, are popular abroad in evaluating free flight performances.

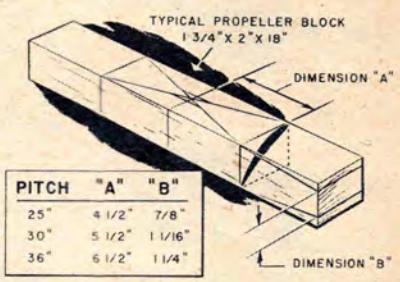
Britain's Hook Brothers, Alfie and Eric, are counterparts of America's famed Good brothers in radio control; their radio components for model plane use are said to be highly perfected. Though heavier than some receivers, the Hook apparatus is dead reliable, so we hear, and has helped reverse a trend to small radio jobs back toward larger models of better performance. Ideal size in opinion of one English modeler who has built various types is five-foot span, 10 inch chord, 3 lbs., 10 oz. weight, Ohlsson 23 (ignition). The model has single receiver, three relays operating rudder and engine speed.

France can boast of radio control flying of very high order. A recent contest winner, victor over several British competitors, was A. Wastable of Moulins. His model is realistic, of good size, built along Cub lines with strut-braced wing. Highly perfected radio receiver employs four tubes, giving full engine speed control and cut-off and rudder positioning independent of usual sequence. Modeler Wastable "chocks" his model's wheels with a strip of balsa, engine idling, then opens engine throttle by radio, jumping chocks for unassisted take-off.

Recent tally of international model records totaled 47 categories of rubber-powered, gas-powered and sailplane models under classifications of duration, distance, height, straight-line (free flight) speed and control-line speed. Of this number, 27 records were held by Russians, 16 by Hungary, three by France, one by Czechoslovakia. The lone U. S. record on this list was Gene Stiles' straight-line speed mark of 129 km. ph.

England's outstanding modeler, Ron Warring, does not apparently join the many who are switching to geared motors, feathering props, extra-long fuselages and the like in hopes of success in the 1951 Wakefield competition. Rules revisions plus Ellila's wins with geared motors and Evans' second place with the feathering prop point to real variety for this year with unorthodox proportioning and wide use of gadgets.

However, Warring, though admitting that Finnish flying conditions require a specialized model, is refining his standard shoulder-wing design. New fuselage structure is 25 percent lighter, stab is of laminated outline, geodetic ribs to resist warps, freewheeling prop



PITCH	"A"	"B"
25"	4 1/2"	7/8"
30"	5 1/2"	1 1/16"
36"	6 1/2"	1 1/4"

is of improved design. Warring hopes for 85-second power run with glide tripling this duration. Test flights on 750 turns are four minutes' duration; maximum turns: 1,000!

Wakefield designers who may be confused by prop block layouts and the precise pitches they yield will appreciate Warring's tip: When "standard" block of 1¾" x 2" x 18" is used, variations in dimension "A" (see sketch) from center alter pitch. Consequently props of various pitch can be made from blocks of identical overall sizes.

4 DMECO'S All American "SENIOR"

THE STAR OF THEM ALL!

WITH THE SENSATIONAL *"Asymmetrical Stability"*

PERFORMANCE

Here is the culmination of years of effort, a truly fine high performance stunt model that is simple to build, easy to fly and a cinch to win for you in contest after contest.

Dmeco's EXCLUSIVE "Asymmetrical Stability" provides the means by which so much performance can be had from such a fine model with so little power.

PRE-FAB KIT

This is truly a deluxe kit with all parts machined to finished size, ready for assembly. Only the finest Grade A1 hand picked balsa is used along with the best of other materials. A ready formed dural "team racer" type gear is also supplied.

The giant plans give FULL SIZE views of the entire model together with exploded assembly views that make every detail completely clear.

SPECS

Wing Span: 51"
Wing Area: 510 Sq. in.
Fuselage: 24½"
Weight: 28 oz.
Power: .29 to .49
Fox; Torpedo; Forster
Ohlsson; McCoy

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1 All American Jr. "BASIC TRAINER"

Designed for learning with the easiest engines to use, the O.K. Cubs. Rugged, and flyable to teach you the easy way.

Kit is ready to assemble with shaped wing, fuselage and tail parts. Follow the full size plans, glue it together and it is ready to fly!

BUILD IN 2 HOURS $1.75

2 All American Jr. "STUNT TRAINER"

Learning Stunt Flying is simple with the "Jr." It's the right combination, slow enough to learn with, yet responsive to keep you out of trouble!

Kit is complete with finished parts ready to assemble. Cement the high quality parts together and it is ready to go!

READY TO ASSEMBLE $2.50

3 The All American "STUNT MODEL"

Here is a true stunt model of superior performance for the engines in the .19 to .29 field. A really fine example of modern stunt design including "Asymmetrical Stability".

You will find the kit ready to assemble from finished Grade A1 materials. Included is a dural "Team Racer" type Gear for that added touch.

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SPEEDWAGON

Speedwagon '50 ..... $5.95
Speedwagon '30 ..... $4.95
Speedwagon '20 ..... $3.95

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Stuntwagon $7.95
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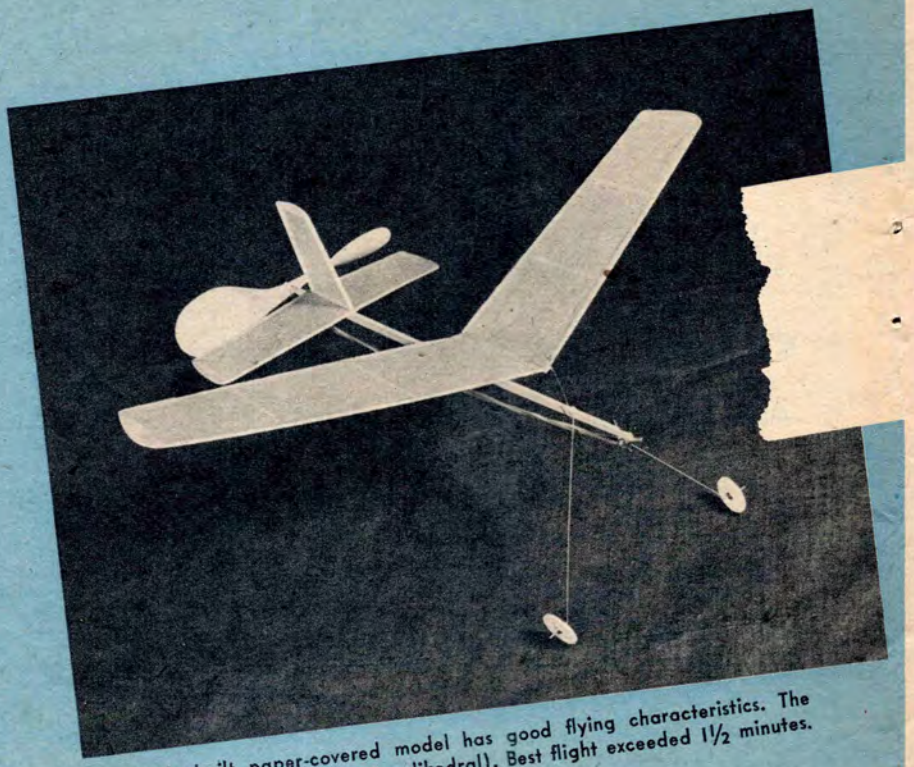
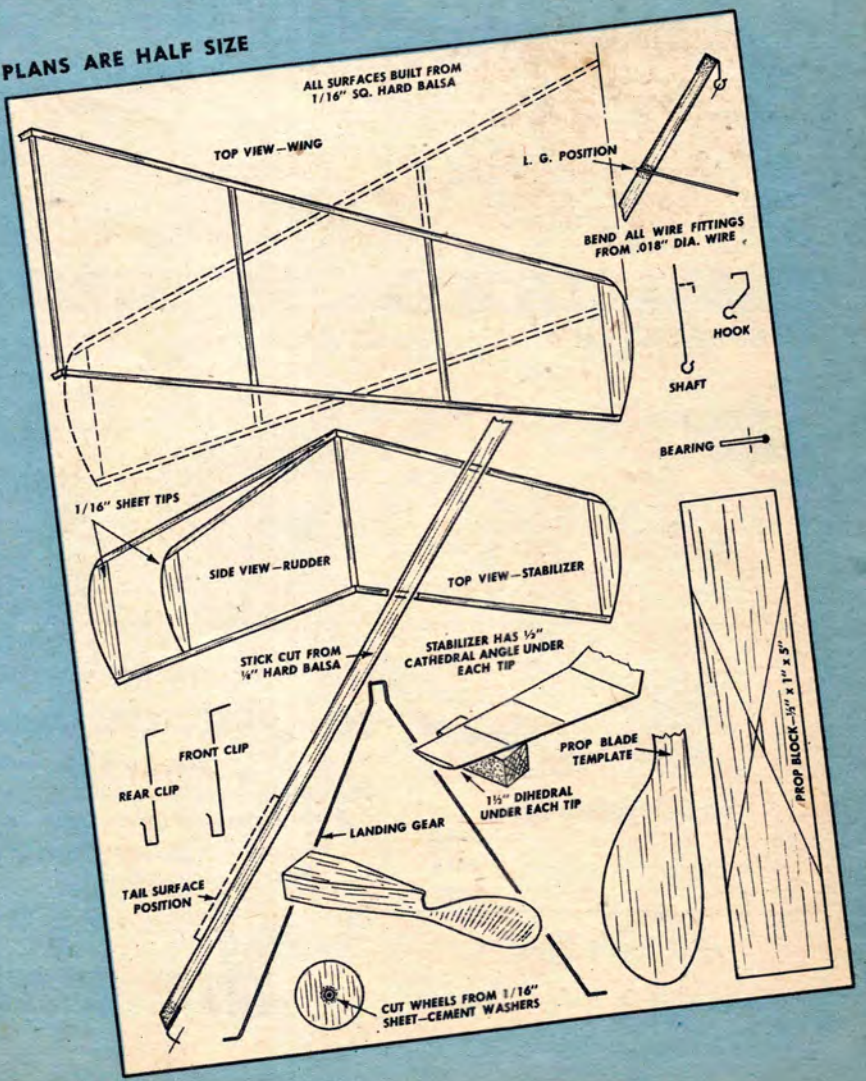


This easily built paper-covered model has good flying characteristics. The stabilizer has cathedral (negative dihedral). Best flight exceeded 1½ minutes.

PLANS ARE HALF SIZE



Pushie

■ The flying qualities of this little job are amazing. Tests made in an armory with only a 30 ft. ceiling produced flights of over 1½ mins.

Pushie is sturdy enough to be flown outdoors in light wind.

Aside from the time needed to carve the prop (a ready-made balsa or plastic prop can be used) you can easily build *Pushie* in one evening. The plans are half-size—double them for full-size parts. Block the wing up for proper 1½" dihedral under each tip. The stabilizer slants downward ½" at each tip. Use lightweight paper for covering purposes. Do not attempt to shrink or dope the tissue covering.

Note taper in the motor stick from the middle to the ends. The front wing clip is ⅛" longer than the rear to give the wing a slight amount of incidence. The thrust bearing can be bent from this same size wire or made by hammering flat the head of a 1" brad, drilling a small hole to accommodate the prop shaft and then bending to shape as shown on the plan. Use plenty of cement when attaching the thrust bearing, landing gear, and rubber hook.

Our original model was powered by a 12" loop of 1/16" x 1/30" T-56 brown rubber lubricated with green soap. A hand drill with a hook placed in the chuck can be used for winding purposes. Experiment with wing location until proper glide is obtained.

If the model stalls under power the thrust bearing can be bent slightly downward, or if it dives under power the bearing can be bent so that the prop when viewed from the side, turns at a slightly "up" angle. Our model had a natural counter-clockwise circle under power.

The circle can be tightened by warping the rudder or by putting a small amount of side thrust on the prop. Excessively tight banking during the circle can be eliminated by warping down the trailing edge of the left wing while facing the model from the front.

(*Continued from page* 54)

domed piston and corresponding cylinder head shape. This is shown by the low mean effective pressure. Horsepower is less than one at 15,000 rpm.

(D). This engine has "featherweight" reciprocating parts. Bore .940", stroke .875", two-stroke cycle. Plate rotary induction valve at the rear, ignition point at the front. The top of the cylinder sleeve stops even with the top edge of the piston and the corresponding cylinder head is domed internally . . . Main casting and bearing mounts are cast in one piece, necessitating a hole through the cylinder (which can be seen in the photo) to permit assembly of the piston pin.

The piston is extremely light (aluminum with rings) . . . Horsepower 0.90 at 15,000 rpm. Poor showing on this engine is due to two features: excessive head heating and restricted bypass passages which we later found to be mandatory for high-power output.

(E). This one is another "Boob McNutt" engine. It is a take-off from a German-made power plant. Has a stepped piston, the combustion space lying between head of the larger end and the stem. Piston is of steel, lapped to the two diameters. Piston pin is attached to the skirt of the larger diameter. When the piston is at bottom dead center, scavenge takes place through the hollow stem or smaller diameter of the stepped piston through ports in the upper end which open when the piston is in the down position. Exhaust is 360 degrees around the upper edge of the larger piston diameter.

Theoretically, this engine had two advantages: the "straight through" scavenge which is apparent from the above, and the additional displacement of the crankcase over the cylinder volume. The engine runs but no power tests were made as it was obviously inferior in performance.

(F). This is a four-stroke cycle job and has, beyond a doubt, the highest rpm of any small engine I ever saw. It has a rotating divided tube across the top driven by a train of spur gears up the rear of the engine. The exhaust passes into the tube at the top and out the front into a split exhaust pipe (not shown in the photo). Fuel and air induction are fed into the back end of the tube and into the top of the engine when the inlet port is open as in normal four-cycle operation; also into the gear train, down and into the crankcase through a valve on rear of engine.

When the piston is in the down position, fuel and air compressed in the case are inducted into the cylinder space through 360 degrees of ports, which gives a supercharge to the engine since the upper rotary inlet port is closed at that time. This case supercharging feature also provides lubrication for gears and bearings in the lower end of the engine. The front case cover has a shaft rotary carburetor blocked off, which has nothing to do with the engine set-up as it is. This was used on another experiment.

The disadvantage of this engine was the valve tube which would seize up when heated by running. We tried straight ground tubes and tapered lapped tubes but could not prevent the sticking up. The engine would start easily, run up to about 28,000 rpm, and then suddenly lock up tight, throwing off the flywheel which would hit the floor and spin on the concrete for a full second before scooting away like a rocket. Bore .940" x .875" stroke.

(G). This engine does not really belong with the display as all of it was not made by us. It is the oldest engine we own, being a Dennymite, altered to incorporate two shaft rotary valves, one on the front shaft and one on the rear, the two valves being coupled with a pipe that passes under the engine and up the back end to the carburetor throat. Cast-iron fins were machined off and aluminum fins installed, held in place by the spark plug. Heavy plate cover over the by-pass opening prevented leakage. Bore .9", stroke .9".

(*Continued on page* 64)

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Perhaps you didn't know that Francisco Racing Fuels have been standard in the high speed fraternities across the nation. For years, the big scale champs have relied on Francisco Racing Fuels to establish new speed records and protect heavy investments in superb racing engines.

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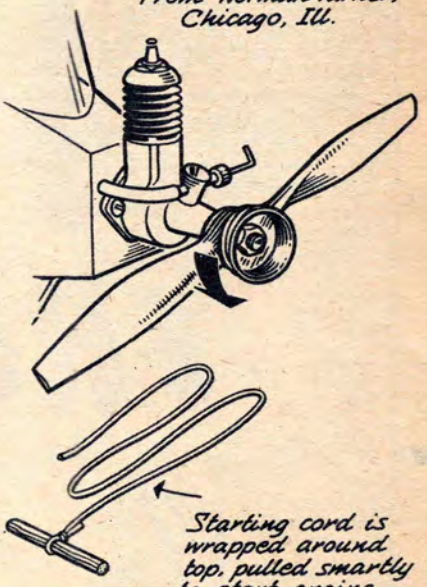
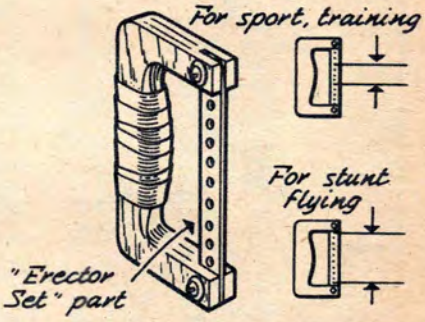
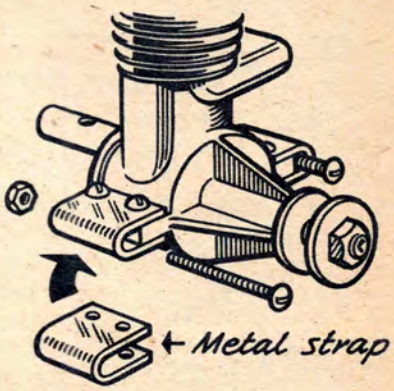
• *Small bottle top, drilled & bolted to front of propeller, is starting aid for small gas engines... From Norman Turner, Chicago, Ill.*



Starting cord is wrapped around top, pulled smartly to start engine

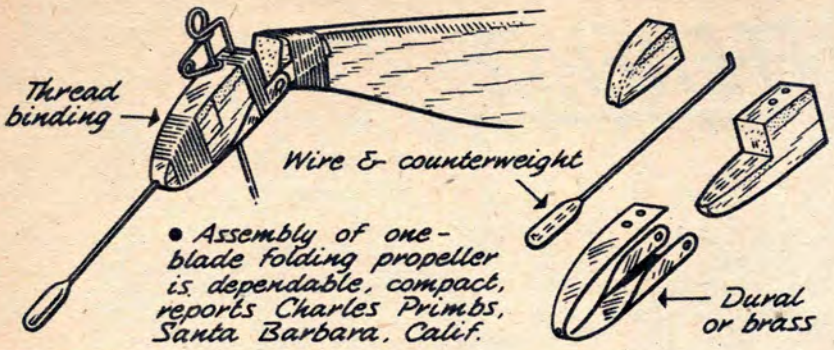


• *Adjustable handle of wood & "Erector Set" part is idea of Jon Walker, Arlington, Tex.*



← *Metal strap*

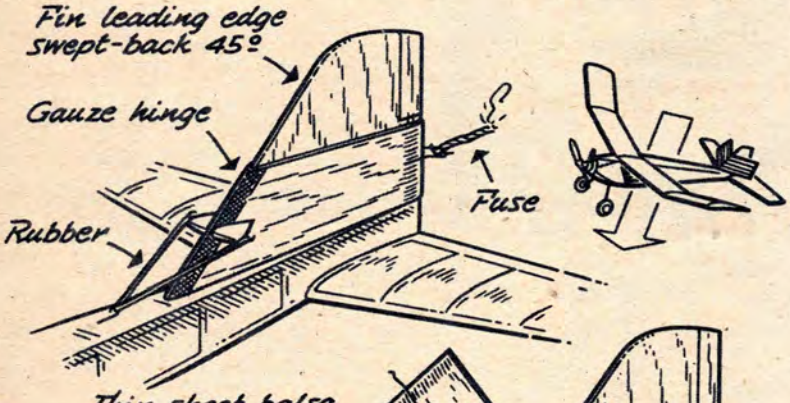
• *Engines with lug-type mounting are easily adapted to radial mounting, thanks to invention of Charles Atkinson, Jennings, La.*

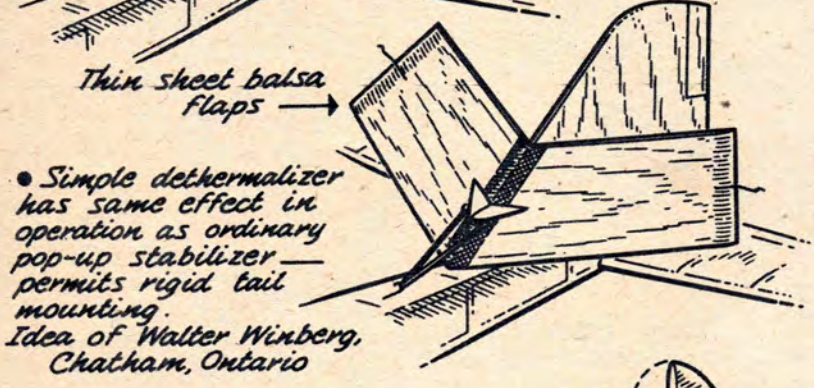


• Assembly of one-blade folding propeller is dependable, compact, reports Charles Primbs, Santa Barbara, Calif.

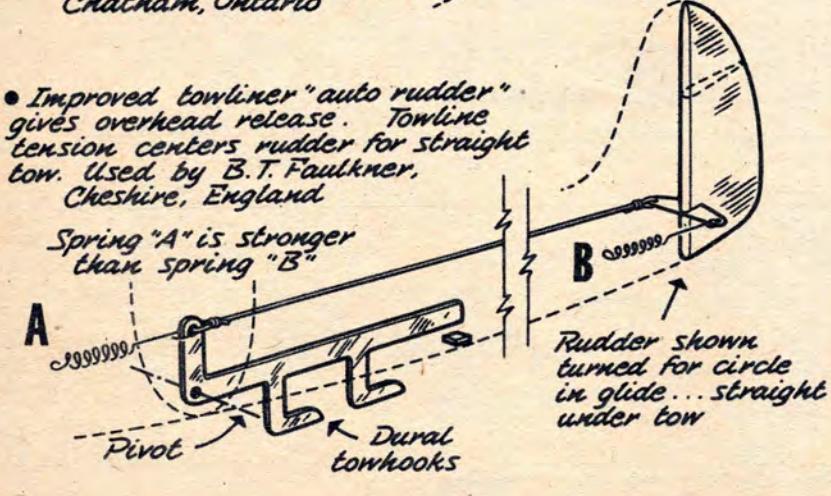
SKETCH BOOK

Have you developed something new in construction, control, or flying that might interest other modelers? Send a rough sketch—we'll redraw it and pay $5 for each one accepted. Sorry, we cannot acknowledge or send back submissions.





• Simple dethermalizer has same effect in operation as ordinary pop-up stabilizer—permits rigid tail mounting. Idea of Walter Winberg, Chatham, Ontario



• Improved towliner "auto rudder" gives overhead release. Towline tension centers rudder for straight tow. Used by B. T. Faulkner, Cheshire, England

(*Continued from page 60*)

Lapped piston, horse-power unknown. This engine was originally installed in a race car and for a time held the record of 60 mph on the Los Angeles banked speedway when 60 mph was really tops.

(H). The interesting feature on this engine is the "loop" scavenging system. Scavenging takes place through two tubes from the crankcase which enter the cylinder wall about 120 degrees apart and "aimed" away from the five exhaust ports and toward the far cylinder wall. The piston has no baffle, is perfectly flat on top, is fabricated from cast iron and lapped to the cylinder barrel. It was an excellent performer as far as torque is concerned but had no rpm to speak of due to the heavy piston and necessarily small porting. . . . Horsepower slightly over one at 12,000 rpm. Bore .940" x .875" stroke.

(I). A two-stroke cycle engine having dual bypass ports, dual exhaust ports and dual side ports in conjunction with a shaft rotary valve at the front end. The engine was first built with the idea of using a supercharger on the back (not shown). This supercharger on the back case discharged directly into the cylinder at the bottom of the stroke during the same period at which the normal bypass operation took place. In running the engine we found that the difference in performance with the supercharger installed was identical to that when it was removed from the engine and the hole covered by using a different sleeve. Consequently, we can say whatever gain in brake mean effective pressure and obtained through the use of the supercharger was offset by the additional drag necessary to drive the apparatus.

The supercharger was of the impeller type with diffusion vanes and a collector ring on the periphery, and was geared so that it ran six times engine speed. This gave the supercharger speed of 120,000 rpm, when the engine ran at 20,000 rpm. Horsepower of the engine was well under 1.0 at this rpm.

(J). A four-stroke cycle engine with a rotating sleeve to give the valve action. It was not supercharged. Rotation of sleeve was accomplished by a set of 1:1 bevel gears, one of which was mounted between two ball bearings on the crankshaft main shaft, and then a 2:1 reduction through spur gears, the larger ring gear being mounted on the lower end of the rotating sleeve. The top of the rotating sleeve was solid with the sides, with one port of a circular sector in shape cut in the flat top of the sleeve. The port in the sleeve as it rotated successively contacted the inlet port in the head, the sparkplug hole, and the exhaust port in the head.

This engine was another that operated beautifully at the slower speeds, *i.e.*, under 10,000 rpm. The main difficulty was the inability to keep the two surfaces between the top of the sleeve and the underside of the head properly lubricated. As seen in the photograph, this lubrication was attempted by using a line from the crankcase directly to the center of the head, such line operating with little or no success. Displacement was 10 cc and the engine had a lapped piston of .940" coupled with a stroke of .875". Horsepower was negligible.

(K). This four-cycle engine in principle is indentical with that described as Engine F, except that it has poppet valves operated by overhead cam through double rockers. Tappet adjustment is accomplished through tapered ends of rocker shafts.

This engine was constructed like a fine watch and even the design of the cam contours was such as to induce valve movements at constant increasing and decreasing acceleration rates during the opening and closing. In operation, the engine did not perform as expected, probably due to the poppet type valves which limited the rpm, so that the maximum was around 13,000 rpm. The engine was built immediately after Engine F, the thought being that we could overcome the disadvantage of the rotary valve sticking

by replacing same with regulation poppet valves. The poppet valves were so small that we found it difficult to maintain proper tappet clearance, to the extent that the heat would change the tappet clearances sufficiently to alter the rate of valve motion.

Due to this fact, coupled with the fact the engine would be extremely expensive to produce on a quantity basis, we discarded it entirely. However, it can be said we put more work into this than any engine we ever built, and from an operating standpoint, it might be classed as a "sewing machine." . . . Bore .940" x .875" stroke. Horsepower slightly over 0.8 at 12,000 rpm.

Demon

(*Continued from page* 33)

dimensions shown on plans. Hollow bottom half out for engine and cut engine pod section apart from the rear half of bottom. Shape engine bearers from ⅜" x ¾" maple, and after cutting off ⅜" from the top of the pod glue the bearers in place. Place the engine in pod and mark off positions of mounting holes. Remove engine and drill straight down through pod at these points. Groove bottom of pod to take the "U" bolts flush. The "U" bolts are made from pieces of bicycle spokes.

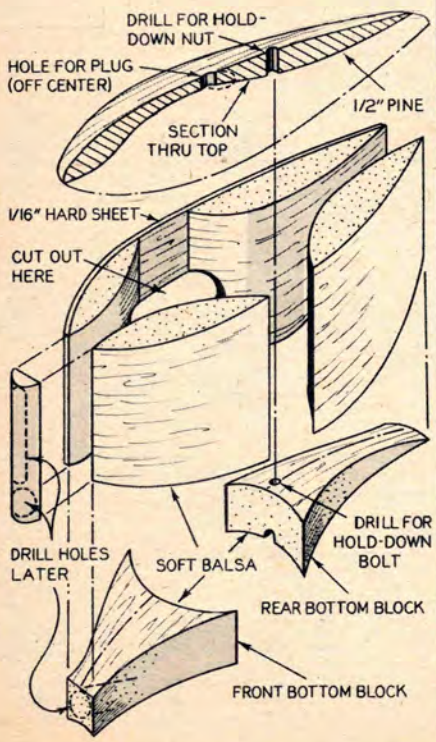
Hollow out the top section of fuselage. Do not cut too thin around the engine station as the location dowel pins go through here. Hollow out the rear section to leave about a ⅛" wall.

Cut wing spar from beech or lemonwood and slot for bellcrank fitting. Notch top of fuselage to take spar flush and glue it in place. Drill two ⅛" holes down through spar into fuselage and glue dowels in them, using lots of glue.

Bolt engine in place in pod and cut out top shell to it. Spot-glue the fuselage together and wrap several layers of masking tape around cylinder and cylinder head. Carve baffle blocks and glue them in place in front and in back of engine.

Cut out cowl top from ½" pine and glue to baffle blocks. Make sure there is perfect alignment. No offset can be tolerated here. Cover entire cowling assembly with 1/16" hard sheet balsa and sand down smooth. Cut cooling

(*Continued on page* 70)



Q and A

QUESTIONS ON ALL PHASES OF AVIATION AND MODELING WITH ANSWERS SUPPLIED BY AIR TRAILS' BOARD OF EXPERTS

To Get Left Glide . . . The recommendations for flying many free flight planes state that the best results may be obtained by a right-hand spiral on the plane when ascending under power and a left-hand spiral when descending in a glide. How does one adjust a plane so as to do this?

I would also like to know the purpose of dethermalizers and how the escapement on a D-E Aerotrol unit works.

Bill Fowler, Elkton, Md.

• The simplest way is to adjust the plane for the desired left hand glide by means of a small tab on the rudder. When the glide turn is correct, the amount of turn under power can be controlled by slight engine offset or change in the thrust line. Prop torque normally makes a model turn left, so considerable right thrust is needed to offset this tendency and produce a right spiral in the climb.

Dethermalizers are used simply to spoil the glide of a model, and so to bring it down out of a thermal (rising current of air) before it flies out of sight and is lost.

The Aerotrol escapement consists of a toothed disk turned by a twisted rubber band, and a magnetically operated ratchet arrangement. The wheel turns one tooth at a time as the operator sends pulses to the plane over the radio equipment. The Aerotrol escapement wheel actually has only two teeth while some others have four. A pin on the wheel is linked to the rudder or other control surface.

Four-bladed Prop for F-82 . . . Where can I obtain a four-bladed prop like the one shown in the sketch of the F-82 in your Model Annual for 1951?

E. L. Kay, Portland, Ore.

• Four-bladed propellers such as used on the F-82 model are not obtainable commercially.

However, it is a simple job to make your own. Just notch the hub out of two ready-made props like Ohlsson or Top-Flite so that they fit together at right angles, cement together and fill any cracks with Plastic Wood for smooth appearance.

We do not recommend using four-bladed props for flying. They are not as efficient as two-bladers and are noted for their ability to rap knuckles while starting.

To Keep Dope On . . . I have been building model airplanes and reading AT for almost two years now and I haven't found out how to keep the dope on the planes yet. On my planes the paint job looks all right until the first flight, then the gas sprays from the engine and just eats the paint right off and ruins a good paint job.

Neil Butterfield, Weedsport, N. Y.

• You state that the "gas" eats the paint off. If you are using ignition and gas-oil fuel, don't put any fuel proofer over your dope finish. Some fuel proofers are dissolved by ordinary gasoline, but will withstand hot fuels.

Any of the regular dopes (nitrates) will withstand gasoline and oil fuels.

If you are using "hot" glow fuels and fuel proofer over regular dopes, the trouble can come from the fuel getting under the proofer through tiny cracks or along surface edges. The fuel will then dissolve the dope under the proofer.

The best way to fuel proof for glow fuel operation is to use fuel proof dopes from the wood outward.

Finish raw wood with fuel proof clear or sealer and add colored fuel proof dopes such as Testor STA or Aero-Gloss. Butyrate dopes are also fuel proof. All fuel proof dopes will withstand most all glow fuels. However, there are some pretty strong concoctions that the best dopes cannot withstand.

To get a good fuel proof, allow plenty of time between coats. Four to six hours

should be enough. Fuel proof dopes set on the surface in a matter of minutes, but the layer beneath does not really dry hard that quickly.

When glow fuel spills or is sprayed onto the model, do not wipe if off immediately; allow a few minutes for the strong ingredients to evaporate. There is a slight chemical action taking place the moment the fuel hits the dope, but the finish returns to normal after a few minutes. Then simply wipe off the oil that remains.

Flying Low-Wing Free Flights . . . Can scale models such as fighters or low-wing personal planes be used as free flight gassies?

Bert Stockstill, St. Martinville, La.

• Low-wing free-flight designs have been flown successfully. There are certain factors that must be taken into consideration, however. The design must have low C.G., low center of lateral area, low thrust line and increased dihedral angle. This combination has been flown with contest performance.

If you wish to try a scale low-wing, pick a type that has these characteristics if possible. The Ercoupe comes nearest to filling the bill. Even so the model should use much less power than the same size high wing. In doing this the problems of torque and spiral instability are somewhat reduced. A typical combination would be an .074 or .099 engine in an airplane with at least 5 ft. span and 575-600 sq. in. of wing area. Performance would not be startling but with plenty of tinkering with offset thrust lines and incidence good flights could be made.

Deflection . . . How should the rudder be tilted on control liners?

Don Block, Pittsburgh, Pa.

• The rudder on a control line model should be turned toward the outside of the circle. This will tend to turn the model outward slightly and help maintain line tension necessary for good control.

"Ukie" from a Wheelchair . . . I'm a semi-invalid (on crutches and wheelchair), and I'd like to know what you think about me flying "Ukie" from a wheelchair.

Henley M. McEhren, Jr., Lake City, S. C.

• Flying control line from a wheel chair can be done if you have a buddy stand behind you and spin the chair for you while you fly. The chair should be on a smooth hard surface so it will spin easily.

Metal Covering . . . I would like to know if there is a metal covering instead of tissue and balsa sheets.

Michael N. Segely, Santa Clara, Calif.

• There is no commercial model material for metal covering available at present.

Various schemes for metal covering have been tried by modelers through the years. Cigarette and candy wrapper foil is one source. You may be able to obtain rolls of aluminum foil used for sandwich and food wrapping sold in grocery and super markets.

The model will have to have very smooth all-wood surfaces. The aluminum foil will have to be applied and handled carefully. It can be doped on. Apply dope to wood and lay foil over it while still in set. Press and smooth into place, hold till dry.

Where to Obtain Dural . . . A lot of your plans call for parts made of dural. Where could I get the stuff in thickness from .020 to .040?

Tom Shaudis, Jr., New Philadelphia, Pa.

• Most hobby stores carry thin dural or aluminum. Your best bet for .020 to .040 thicknesses would be the maintenance shop at your local airport. They would probably give you small scraps for the asking. Large sheets would have to be purchased.

Flying Solid Jet Model . . . I am working on a solid model jet plane and would like to know how I can make it fly.

John L. Blalock, Hinesville, Ga.

• Depending on the size model you have built, you could power it with Jetex, Dyna-Jet or simply fly it as a glider.

If you intend to fly the model your construction will have to be very light. Extra dihedral will have to be added to the wings. Swept-back wings do not lend themselves to flying in model form very well.

If the model is small (7-8 in.) you might hollow out the fuselage for a CO_2 cartridge, add two screweyes on the fuselage top and fly it along a 100 ft. length of wire strung up outside between two poles or trees.

Pressure Fuel Tanks . . . I would like to know whether I would need a fuel regulator with a pressure tank, and still get the correct fuel supply without flooding the engine.

Bradley Emerson, Jr., Henderson, Ky.

• Several types of pressure tanks have come into use. The Jim Walker Pressure

system, made by American Junior Aircraft Company, uses a rubber tank to develop the pressure and must be used with a fuel regulator valve. Another system developed by Harold deBolt uses a metal tank with pressure supplied from the base of the engine. This arrangement does not require a regulator. This fuel system was discussed thoroughly in a series of articles in Air Trails during the last half of 1950.

Using a CO_2 on Control Line . . . Can you or can you not use a CO_2 on light control line planes?

Vance Creech, Salemburg, N. C.

• CO_2 works fine on C.L., but you should use either the Campus or A-100. The OK CO_2 has plenty of power (as much as the smaller ½A glow plug engines) but doesn't run very long. The two smaller CO_2 engines have refillable tanks and run longer. Keep the planes light and the control lines as small as possible. These CO_2 powered planes would be most satisfactory for indoor use.

The approximate displacements for a CO_2 are as follows:

OK CO_2 disp.	.012 cu. in.
Campus Bee or Buzz CO_2	.0052 cu. in.
Campus A-100	.0015 cu. in.

Life of a Half-A . . . I have read many articles saying not to run your motor unnecessarily and instead save motor for flying. Each motor has a certain number of running hours, but what is the approximate running time for the Half-A motors?

What is the required number of pounds of air pressure necessary to run the compressed-air engine?

Where could I buy a small amount, say one foot of the wire used in glow plugs and what would the cost be?

Bob Putnam, Prescott, Ont., Can.

• The useful running life of model airplane engines varies considerably from one design to another, and also is greatly affected by the speed at which the motor is operated. The average Half-A engine running at 12,000 rpm should last fifteen to twenty hours.

Compressed air or CO_2 model engines should have one hundred pounds pressure or more to develop full power. You should be able to experiment at a gas station with their compressed air supply.

The wire used in glow plugs is pure platinum or an alloy containing a high percentage of platinum. This should be obtained from a laboratory supply house, but would be quite expensive. If you could get the wire you would experience considerable trouble attaching it to the glow plug body. Each end is attached by an electric welding process and cannot be accomplished except by elaborate machinery.

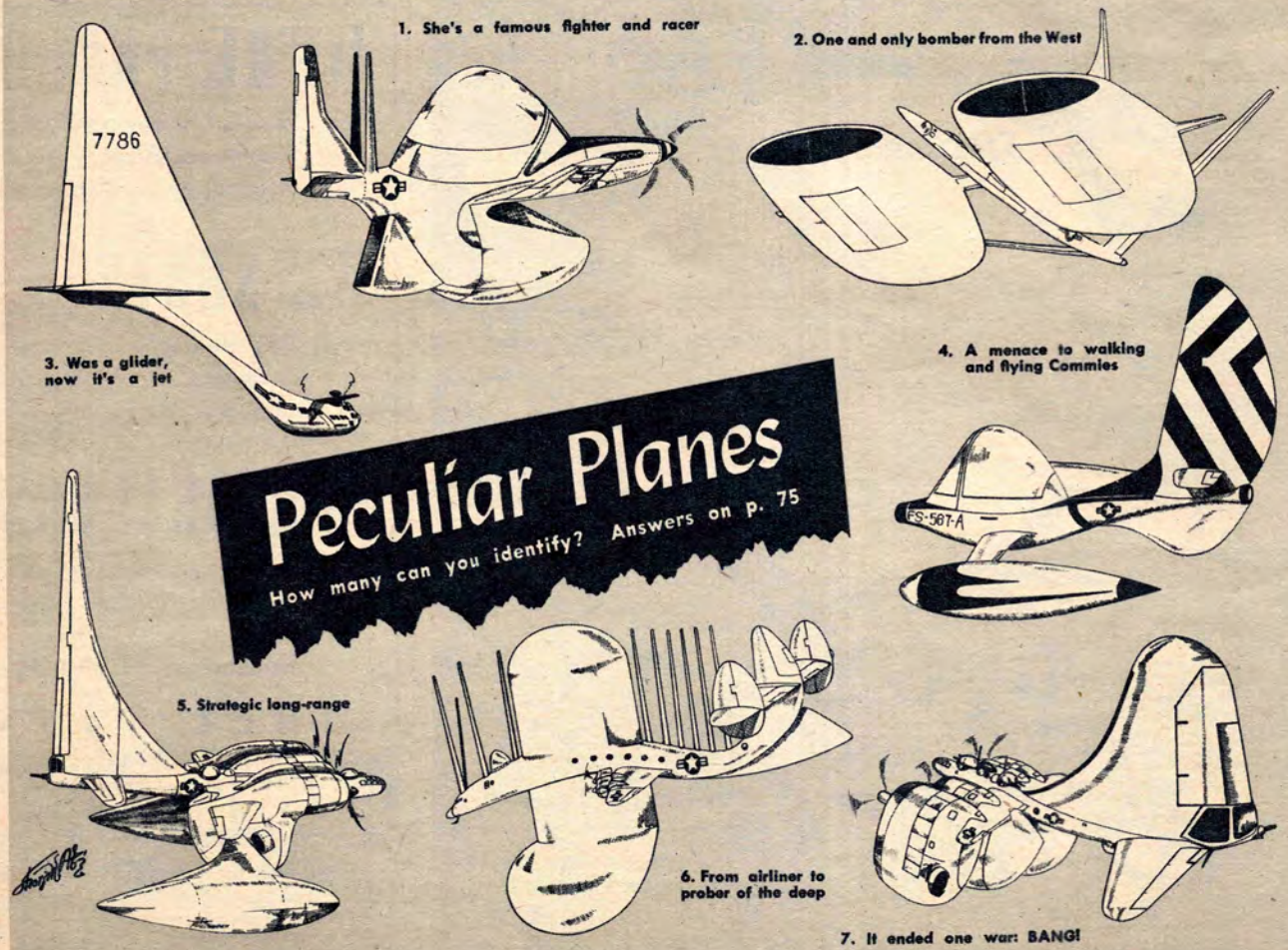
Synthetic Oils . . . Can you give me the names of companies selling synthetic oils? Have used silicone oil but it does not operate too well in model engines.

Fred Schlumpp, Elmhurst, N. Y.

• Synthetic oils have been used recently in commercial fuels and little information is available concerning what the manufacturers use. One reader picked up a lead on oils used to lubricate conveyors carrying parts through high temperature ovens in manufacturing plants. A material called Caloria and another, Van Caloria, were suggested for high temperature work and they are supposed to burn off leaving no deposits.

Peculiar Planes

How many can you identify? Answers on p. 75



(Continued from page 65)

holes and exhaust hole as required in front and in side of cowling. Small front hole should be drilled down at an angle to supply cooling air to the crankcase and to the venturi.

Cut stabilizer and rudder from 1/16" birch plywood and sand them to streamline section. Cut elevator apart from stabilizer and mount control horn. Use aircraft fabric "Z" type hinges. Cut out bottom of top section of fuselage to take the stabilizer flush. Use a flat surface to line up bottom of stabilizer with parting line of fuselage. After cutting holes in fuselage to clear pushrod, install bellcrank and pushrod. Cut out rudder to clear control horn and rod and install rudder. Cover hole in rudder with 1/16" sheet balsa fillets and sand them down.

Cut two wing panels from pattern given. These panels are cut from 012-24ST aluminum and are bent over a sharp straight edge to form the leading edge of wing. Form each panel so that upper camber is greater than that of the lower. Drill 1/16" holes on 5/8" centers for the trailing edge rivets, and countersink these holes slightly.

Starting from the middle and working right and left, insert 1/16" rivets through holes after bringing the trailing edges of panel together. Cut off rivets so that only about 1/32" protrudes and then, using a small hammer and a piece of smooth steel as a butt block, complete riveting job. Do not pound the rivets *too* hard as this will cause the trailing edge to be wavy. The wing tips are cut from hardwood, slipped into place and riveted to the metal skin.

Now slip the finished wing panels over spar and secure in place with four 1/4" #0 woodscrews—two to each panel. Locate one screw 1/8" from fuselage, driving it from top into spar. The other screw is located 2 1/2" from wing tip and is driven from the underside into spar tip. Again use a flat surface during this operation to insure perfect alignment of panels. Leading

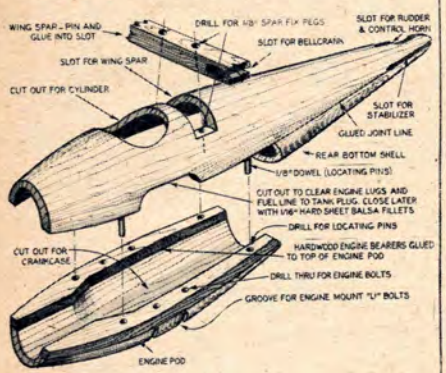
edge and trailing edge should be exactly the same height from work board.

Form fillets from balsa and glue to fuselage and wing roots. Sand fillets smooth so that wing fairs neatly into fuselage. The rear bottom shell of fuselage may now be glued permanently to top shell and the entire model sanded down smooth. Cover the entire fuselage, cowl and rudder with gauze, using two thicknesses wherever fillets occur.

Apply several coats of filler, sanding well after each coat, and then spray model with any good fuel-proof finish or Dulux synthetic enamel.

Bend tank plug from a piece of 1/8" soft wire. Drill a hole for same behind engine in the pod section, insert plug and secure it with a washer soldered in place on inside of the pod.

Flying this model is very easy since it is a stable airplane. Starting the engine requires a little practice. The general procedure is as follows: Make sure the needle valve is turned off. Fill the tank with an ear syringe, using as much or as little fuel as you like. Hold the model in the left hand and insert spinner in the starter. While the engine is turning over, open the needle valve until the engine starts to catch. Now take the plane away from the starter and adjust the engine until it is just breaking into a four-cycle movement. Reason for leaving the engine so that it is rich on the ground is that the amount of fuel from the tank remains the same, but the engine takes in more air after the model is airborne and leans out the mixture.



Midgets

(*Continued from page 25*)

when in normal sitting position and it must permit the pilot to turn his head sufficiently to attain the field of vision specified, with his crash helmet on.

The two NAA-sanctioned events for the 190 cubic inch class of racers during 1948 were the Continental Motors Corporation Trophy Race at the Miami All American Air Maneuvers in January and the Goodyear Trophy Race at the 1948 National Air Races over the Labor Day weekend. Twelve midgets qualified at Miami and twenty-three at the National Air Races. The three winners of the finals in each competition (both twelve laps of a 2-mile course) were:

CONTINENTAL TROPHY

Race No.	Pilot	Speed (mph)	Purse
20	William Brennand	166.5	$1480
3	H. R. Salmon	158.5	880
5	A. C. Chester	145.7	680

GOODYEAR TROPHY

4	H. R. Salmon	169.6	$7000
1	S. J. Wittman	168.9	4000
2	A. C. Chester	168.2	2200

Slight modifications to the 1948 specifications for the 190 cubic inch class of racers were approved for 1949. These included a recommendation that dynamic or static balancing of ailerons be accomplished by all race plane owners, plus a listing of engine alterations which would affect adversely the ATC of the engines being utilized:

(*Continued on page 72*)

P-26A

(Continued from page 50)

control system, if you expect to fly on lines.

The choice of motor depends on the choice of flight; an O&R 23 is shown on the drawings, but most large A's or the B sizes will fit in. The kit includes mounting nuts and bolts, something of a rarity these days. For free flight, large Half-A or small A engines are recommended.

After your motor is mounted in place, with thrust line set as indicated on the side view, you open up a protective box and take out what proves to be one of the big features of this particular kit, a fully shaped nose piece and cowl ring. The free flight engines will be almost entirely covered by the cowl, while even the B controline engines won't project too far above; realistic appearance is thus assured.

The original P-26A was an extremely colorful ship with its yellow wing, blue fuselage, white tail surfaces, plus lots of scallops and stripes. The kit includes all the required decals, the wing insignia being of the authentic old style with red center. The tricky scalloped edges on fin and stab are easy to make, for die-cut patterns are a feature of the kit. The long fuselage stripes are furnished in decal form. There are also insignias and numerals of the 34th Pursuit Squadron, after which the decorative scheme is patterned. If finished up according to the plans, you'll really have a colorful, yet absolutely authentic, scale model.

With the degree of prefab shown in the P-26A and Great Lakes Trainer kits, it is now a lot easier for the relatively inexperienced builder to assemble a workmanlike copy of one of Cleveland's long-famed authentic scale models. And we can say "long-famed," for this organization claims title as the "World's Oldest Model Airplane Kit Manufacturer"; they've been at it since 1919!

Midgets

(Continued from page 71)

Any change in dimension from the combustion chamber head to the lower face of the cylinder hold down flange; any alteration in height of top of piston head over the center of the wrist pin hole; any dimensional change in the bore or stroke; any alteration in the length of the connecting rod between the center of the wrist pin hole and the center of the crank pin hole; any change in the dimension of the inside diameter of the carburetor venturi or of the injector throttle body; any change in the dimension of valve lift; any change in the weight or characteristics of valve springs; any change

of the intake ports in polishing, other than smoothing the port; (it is considered that the port is polished, but not enlarged when low spots will mottle the surface where polished); any change in dimension across the top of the crankcase between cylinder mounting pads; and use of a spark plug make or model not approved in the engine; any change of valve seat angle from 45 degrees; any use of water injection; any use of a pump or blower to increase carburetor inlet pressure; (it is considered that resetting of magneto time would not affect the ATC as long as approved magnetos and parts are used. It is considered the ATC would not be affected if the throttle lever were moved to the opposite side of the injector unit).

NAA-sanctioned races for the 190 cubic inch class during 1949, and the first three winners of the finals at each were:

CONTINENTAL MOTORS CORP. TROPHY RACE FINALS, 17TH ANNUAL MIAMI ALL AMERICAN AIR MANEUVERS, JANUARY 9, 1949

Race No.	Pilot	Speed (mph)	Purse
1	S. J. Wittman	176.9	$1900
20	William Brennand	174.2	1100
21	T. B. Heisel	170.0	850

GOODYEAR TROPHY RACE, NATIONAL AIR RACES, FINALS SEPTEMBER 5, 1949—12 LAPS OF A 2-MILE COURSE

Race No.	Pilot	Speed (mph)	Purse
20	William Brennand	177.3	$7000
39	Keith Sorenson	176.7	4000
1	S. J. Wittman	176.2	2000

REBAT MIDGET PLANE RACE, READING AIR SHOW, FINALS SEPTEMBER 25, 1949—10 LAPS OF A 2-MILE COURSE

Race No.	Pilot	Speed (mph)	Purse
20	William Brennand	164.7	$450
1	S. J. Wittman	163.9	250
47	James Wilson	156.0	125

The Professional Race Pilots Association, as an affiliate of NAA, was authorized to sanction, on a "Guarantee and Percentage of the Gate Basis," sev-

eral midget race events on the West Coast to be organized by professional promoters during 1949.

The 1949 specifications for the 190 cubic inch class were revised further by the NAA Contest Board. These included permitting the use of any make spark plug in the future; a "must" requirement that ailerons be dynamically or statically balanced; abolition of the minimum weight requirement, effective January 1, 1952; permitting the use of a single type fuel of any octane rating, which must pass through the ATC's fuel metering system; forced draft ventilation of cockpits; establishment of a 50-foot minimum altitude requirement; more rigid flight test requirements for the aircraft and qualification tests for the pilots.

CONTINENTAL MOTORS CORPORATION TROPHY RACE, 18TH ANNUAL MIAMI ALL AMERICAN AIR MANEUVERS, FINALS, JANUARY, 1950 —12 LAPS OF A 2-MILE COURSE

Race No.	Pilot	Speed (mph)	Purse
1	S. J. Wittman	185.4	$1800
5	Keith Sorenson	182.0	1000
16	Robert Downey	181.3	750

FIRST ANNUAL WESTCHESTER AIR RACES, WHITE PLAINS, N. Y., FINALS JUNE 24, 1950— 12 LAPS OF A 2-MILE COURSE

Race No.	Pilot	Speed (mph)	Purse
20	William Brennand	175.967	$750
67	Luther Johnson	161.119	500
14	James W. Miller	158.532	300

NATIONAL PILOTS AIR MEET AND RACES, CHATTANOOGA AIRPORT, FINALS JULY 16, 1950—12 LAPS 2-MILE COURSE

Race No.	Pilot	Speed (mph)	Purse
20	William Brennand	176.687	$1350
8	Phil Quigley	175.860	900
47	James Wilson	163.019	450

CONTINENTAL TROPHY RACE, INTERNATIONAL AIR FAIR SPONSORED BY THE AERO CLUB OF MICHIGAN, DETROIT-WAYNE COUNTY AIRPORT, ROMULUS, MICHIGAN. FINALS AUGUST 13, 1950—12 LAPS 2-MILE COURSE

Race No.	Pilot	Speed (mph)	Purse
3	John P. Jones	187.785	$2000
1	S. J. Wittman	185.050	1250
30	Keith Sorenson	184.576	750

1950 REBAT RACE, READING AIR SHOW, READING, PA., FINALS SEPTEMBER 24, 1950—12 LAPS OF A 2-MILE COURSE

Race No.	Pilot	Speed (mph)	Purse
1	S. J. Wittman	185.455	$800
20	William Brennand	183.713	500
8	Phil Quigley	179.253	300

It is estimated that there are now at least sixty specially built 190 cubic inch class racers, in complete condition, throughout the United States.

PHOTO CREDIT LIST

Pages 20-21—Top: Howard Levy.
Page 28—Top: Howard Levy.
Page 29—Bottom: Acme.
Page 31—Acme.

ROGER

Towline Gliders

(Continued from page 36)

lack time, you can eliminate the special shaping rib which is cemented to the fuselage. Just make this portion of the fuselage straight by making a bit narrower bulkheads. And cement the plywood rib directly in the sides.)

You can now cement the bottom in place. Next, insert the tongue in the slots. Slide wing halves on it. Line up the wing at right angles to the fuselage. Cement-tack the tongue to the sides. Also cement the bulkheads which you will find above and below the tongue. The wing halves do not have to be held against the fuselage; just make sure that they are at right angles to it. Once the cement is set enough to hold the tongue in position, remove the wing halves and continue work on the fuselage.

Before you can cement the top platter in place, go over all joints and recement so that you will have cement fillets at corners. Cement the tow hook and bring the balance point to an approximate spot. The balance box itself is too small to accommodate the entire balancing ballast. Therefore, place the necessary ballast in the compartment behind the balance box.

An approximate balance is obtained by placing the stabilizer and rudders at their positions. Using the rear edge of the tongue as a balance point, add enough lead or iron bits to the next to front compartment until a balance is achieved. Cement the ballast to prevent it from flying off or shifting during flight. The actual C.G. may be eventually found a bit forward of this point. However, the usual balance box will be able to accommodate matters.

After cementing the top pattern in place, finish the fuselage with graded sanding. The designer recommended four coats of wood filler. Since the sides are relatively thick, you can use 50-50 cement and dope mix if you prefer, for filling and finishing the fuselage. Four coats will give a smooth and tough coverage. Finish with 7-0 sandpaper.

Before covering the wing, cement in place the stub ribs. The purpose of these is to back up the thinner rib, and also to give more body which can be shaped to fit the fuselage connection.

The rudders are cut from balsa sheet. Cement the lower one securely, and use a corner block fillet.

Add enough ballast until a smooth glide is obtained. Then cover the balance box as you should not change the C.G. position. Adjustments from now on should be made with rudder and stabilizer.

The model gave us no towing trouble, although it had a fairly tight circle. The designer recommended a warp in one wing, and then counter rudder to produce good towing and still have circling glide.

For circling adjustment, without using warped wing idea, the procedure is as follows: If the model has a natural turn, use it. If you desire a tighter turn, set rudder gradually. As the model tends to steepen the turn, bring it back to a "loafing" speed by giving the stabilizer a slight negative setting. In fact, after you have obtained a smooth straight glide, do all your up and down adjustments with the stabilizer. You will be surprised how much tighter and safer circles will be.

Since the wing is not held on with rubber bands to a definite position, check it before every flight. Make sure that the junction points are closed, since the sharp dihedral angle can be very sensitive to an "angled" wing.

Answers—Peculiar Planes

1. North American F-51. 2. Convair XB-46. 3. Chase C-123. 4. Republic F-84. 5. Boeing B-50D. 6. Lockheed PO-1W. 7. Boeing B-29.

Roundup

(*Continued from page 47*)

the outcome of every article he could find on props and their theory. The area was calculated from a C. H. Grant formula, taking into consideration the model weight, wing area and cleanliness of model. The side view is a segment of a perfect circle. The calculated area was laid out on graph paper with the maximum area at 70% from the hub. Through interpolation, the front view and consequent outline were derived from this graph.

The finished model has the following characteristics: span 45″, plan area of wing 222.5 square inches, stab 71.2 square inches. Length between rubber mountings 36 inches. Total fuselage length 38 and ⅜ inches. Prop 20 inches diameter, pitch 30 inches or 1.5-1, power 14 strands 59″ long. Winds possible 1360. The model has been flown on 1000 winds and on these turns will do 5:15 to 5:40, with a prop run of 1:45.

Red calls this ship 3:5 since he did manage to build it to this ratio. The wing airfoil is a Jakowski set at 3.5 degrees with C. G. at 50%. The landing gear is a single retracting strut of ⅛″ balsa. The dethermalizer is a small tissue parachute.

There it is, the one model which actually does over five minutes in contests.

The *Hi-Tailers* seem to think that the best way to run a contest is to abide strictly by the rules. Their recent Half-A PAA load contest was just this. When the payload men were underweight, they obligingly supplied the necessary weight in the form of B-Bs and instructed the entrant to add them permanently, then come back. Those whose jobs were undersized were told to bring them up or not fly. Many an entrant was tapped on the shoulder and told that his flight was delayed since he pushed. The rules were adhered to; consequently when the fellows found this out, they tried to abide by them, and this resulted in a very smooth contest.

The 34 entrants more than justified this new class which Pan Am has introduced. Many a fellow went home with some very good experience, some of which we shall try to pass along for your benefit. Ships with single-wheel landing gears had a hard time getting off, so there are quite a few two-wheel landing gears being added to models. Weight plays a prime factor; the boys who managed to build down to weight got their ships off faster and they climbed higher. Motor runs seem important. The ships with motor runs of 18.5 to 20 sec. made much higher time. Those last five seconds seem to get the ships up twice as high as the previous fifteen.

Of the originals, wing areas varied from 135 to 240 square inches. The high placers all used 185 to 210. Fuselages varied from full cabins, to semi pylons, through cabane struts and bubbles. Tail areas varied from 35 to 43%. Sheeted leading edges were very popular, pop-up tails with fuses were standard equipment.

The winning ship *Paakid*, designed and built by Tommy Moffitt, had a 37″ span with 210 square inches of area, airfoil was 8% thick and flat bottomed. Fuse was 28 inches long of ⅛″ square construction, tail area 40%. Weight 9 oz., complete, power Wasp, prop 5½/4 Kaysun.

Second place Nat Antonoli also flew a Wasp-powered job which he calls *Paalug*. Wing 200 square inches, 34 inch span, 6 inch chord. Horizontal tail 100 square inches. Nat's construction was a little unorthodox, his wing and tail had diagonal ribs with sheeted leading edges.

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Jack Oxley who won third flew a modified *Powerhouse* fuselage with *Zeebin* wing and tail.

One very interesting development was the almost exclusive use of Firebaby wheels on landing gears. Even so, considerable difficulty was encountered due to poor ground stability at low speeds. One fellow who had previously battered the front end of his ship, was seen to take off very nicely, his model went up and over in a loop, at the bottom, the front end came out engine and all. The officials were in a dither trying to figure that one out.

Andy Peterson of "camp stool" fame is conducting a very interesting experiment. Andy had long wondered if it were possible to counteract torque by offsetting the thrustline much the same as hooks on towline gliders. At the present time, these asymmetrical ships are going through a development stage. From flights we have observed, he has been able to get a power flight to the right with little or no right thrust. He may have something there.

Have you ever noticed how those ships with deep bellies and/or underslung fins like the *Jaguar* seem to have a little lacking in the way of perfect stability? Well, a new theory has been advanced by a prominent West Coast modeler, that this may be due to a decrease in effective dihedral because of excess area under the C.G. Some experiments are being conducted on such a ship by mounting the wing on skids on top of the fuse. This may also be simulated by putting a fin on the bottom, then flying. Remove the fin and put it on the center section of the wing. When it is on top, stability should increase. It actually helped considerably by mounting the wing on skids. It has been known for a long time that a fin located in the center section of a wing will increase effective dihedral, in fact we have seen a small gas model flown using a tail from a larger model with no dihedral.

Even with all this, we can't help but wonder whether it is all worth it. One San Diego *Aeroneer* recently put two right panels together, the one on the left side having the airfoil inverted. To say the observers were dumfounded is putting it mildly. The ship climbed in a tight circle and glided the same. Although the flight pattern was not perfect, it flew. Wha' hoppened?

—DICK EVERETT.

Dope Can

(*Continued from page 47*)

the way from the meet director down to properly qualified timers.

"Aside from the serious business of flying our models in stiff competition, we are at the meet on vacation and out for a good time. We want to blow off steam and raise a little rumpus when and where we please. Don't throw military S.O.P. at us.

"Rumor had it that this year's affair was to be held near a site which saw two of the best Nationals so far; an area that is ideally situated and in a part of the country virtually infested with model flyers. Here was a chance to give new blood to events that were lacking in participation only because of the regions selected for previous Nationals. What happened to this ideal location? The Navy found it inconvenient to have it there and had only one site available—Dallas.

"Who are we trying to please, the Navy or the licensed model builders? We say, 'Give the Nationals back to the model builders.'"

Before we tear into some of those remarks, we better quote from the A.M.A. bulletin, "Model Aviation":

"The site (for the Nationals) has been cleared by the sponsoring, cooperating and sanctioning bodies: The National Exchange Club, Navy, and A.M.A. Contest Board . . .

"In locating the (meet), there were a number of factors taken into consideration. Foremost was the necessity of holding (it) at a Naval Air Station where Navy activities could be conveniently adjusted. The Navy feels that NAS Dallas would best suit our needs and, in addition, Captain Nieman (base CO) . . . has expressed a desire to have the meet there.

"Also of great importance is the necessity of holding the meet in a city where a qualified local Exchange Club exists. The Dallas Exchange Club desires to conduct the contest again and, with last year's experience, feels they will be able to better the meet in many, many ways.

"Among the improvements planned for the Nats are a reduction of expenses to contestants, meals on the Station with more food available, changes in contest procedure, and many others which will make a better meet for all."

Having been to every National contest during the past 14 years as a contestant, official or observer, we think we have a few words of wisdom for the *Balsa Bugs*.

First—the Nationals will be slow to improve until the licensed modeler insists on fewer events and the elimination of many local modelers who would not travel 100 miles to enter a contest, but who pile into the Nationals in alarming number only because it's held in or near their home town. Notice that we don't say these restrictions *should* be applied; we merely state that improvement in contest procedure is dependent upon both points. You want a better Nationals each year? Then you want less events and fewer participants. Will this ever happen? We wonder.

Second point—it is entirely unfair to blame the Navy, the sponsoring Exchange Clubs of Dallas or the meet directors for any slip-ups last year. Hundreds of Navy men were to have been trained as timers and recorders. It all shaped up as an excellent meet. Who could have expected we'd be involved in the Korean conflict just a short time before the contest went on? Another consideration: the weather was terrible and completely foreign to what one could expect in Texas at that time of the year.

The *Bugs* want a Nats "scheduled to suit all model flyers." We say it is absolutely impossible to schedule anything to suit everybody. As for the separate events in different locations, that must refer to the indoor meet in Ft. Worth and the outdoor events at NAS. What's the *Bugs'* answer? Run the contest an extra day? Maybe running off the indoor events at night might be the partial answer.

Most National meet contenders have little appreciation or understanding of the mammoth task involved in organizing such a meet, handling the large crowd of flyers and spectators, keeping the results, making the awards, handling publicity, listening to gripes—to mention a few of the major operations. We imagine there has not been a single National meet contest director to date who would not be very happy to "give the Nationals back to the model builders."

But, unfortunately, it is not that easy. Somebody has to do the work. The surprising thing is that there are such organizations as the public-spirited, air-minded, young-in-heart Exchange Club to carry the burden for a five-year period. And to think that after all these years the Navy was the service to open up its facilities to the modeler—when right along it should have been

"Three thousand turns should be sufficient, Jeeves."

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the Air Force! Thank goodness for the Navy and its far-sighted leaders, not to mention a CO like Capt. Nieman who actively sought to have the contest returned to his station.

We don't condone laxity in processing in any meet, particularly the National championship competition, but we have yet to see a meet where a contestant couldn't have shaded or broken some or many rules if he was so minded. And many a National meet prior to the '50 affair was run off in a slipshod manner because of various reasons. We recall with a shudder the Minneapolis-Monticello massacre where modelers were timing each other's flights and a leading contender for the high-point prize, a lightplane, was disqualified.

If the *Bugs* didn't like the '50 Nats they certainly couldn't be counted as favoring the '46 competition—the "Victory Nationals." Yet that was perhaps the most remarkable meet of them all. After Chicago interests had backed out of sponsoring the affair almost at the last minute, with modelers all packed and ready to leave for the contest, a Boeing engineer and a Y.M.C.A. branch manager in Wichita, Kans., put a meet together that was a modeling miracle. Sure, there were a lot of shortcomings, but better that than no contest at all.

Now, how best to avoid these last-minute meets? Certainly the Nationals deserve something better than that. Well, why not enlist the aid of some national organization like the Exchange Club which has demonstrated its interest in model aviation over a long period, and let that group take over the active sponsorship (in conjunction with its local units) of the Nats? And tell us, please, what better location can you imagine for a model meet than a military airfield?

We think the *Balsa Bugs* are entirely justified in asking for better run Nationals. Ever since this competition went to Detroit in 1936 and began to increase in size there have been numerous problems associated with such a large operation run for the most part by volunteer help who, instead of being paid, are asked to take time off from their work to handle the contest.

We say again, as long as the Nationals are open to anyone (and that usually means 750 to 1,000 entrants) and as long as the number of events and competitive age groups is close to 60, then your contest will always produce a certain amount of confusion.

Speaking of Big Meets. You'll recall the Tangerine Internationals in Orlando, Fla., last winter? Well, the 2nd Annual T.I. contest has been set for Dec. 28-30, 1951—same spot, same sponsor according to Thomas Mickler, president of the Exchange Club of Orlando. The contest featured 37 events; just about the most of any meet other than the Nats and Plymouth Internats. James Monroe, Miami, was crowned meet champ, by the way. Roger Barron, Springfield, Va., was runner-up. Ten states and Mexico were represented. If you're planning to be in Florida next winter you can request data on the meet from Box 123, Orlando, Fla.

Hail to American. If an enthusiastic and ever-growing membership is indicative of a successful organization, the *American Airlines Gas Model Club* of Cleveland, Ohio, is outstanding. If the ability to earn and hold on to trophies and medals shows that a group has great ability, then that club is "tops" in the Midwest.

Founded and chartered March 30, 1938, the organization is the oldest active model airplane club in Ohio. Originally a gas model club, the group's present activities include all phases of model building and flying—indoor and outdoor.

Original sponsors were Harry D. McCall of Mac's Model Shop, Ed Clarke, then Aviation Editor and now Travel Editor of The Cleveland Press, and George Cussins, then district sales manager for American Airlines in Cleveland. Successive Cleveland sales managers for A. A., including Gerry Hawes who is in Cleveland at the present time, have continued active sponsorship, together with Clarke of The Press.

Outstanding and famous members of the Cleveland club include: Lyman Slack, Jr., an outstanding high-point champion who, in 1949, was high-point junior champion in the Junior National Air Races held in Cleveland.

Jack Norris, club champion for six consecutive years and senior high point champion of National Meet, Wichita, Kansas, in 1946.

ADVERTISERS' INDEX

August, 1951

While every precaution is taken to insure accuracy, we cannot guarantee against the possibility of an occasional change or omission in the preparation of this August, 1951 index.

John Humphreys, junior high point champion of Nationals, Olathe, Kansas, 1949.

William Schwab, originator in Cleveland of control line flying.

Harold Coovert, chief designer for Peerless Model Airplane Co.

Chester Lanzo and daughter, Sylvia, a famous father-daughter team. Sylvia was the girl champion of the International Meet, Detroit, 1949.

William Mickelsen, runner-up in the 1950 Wakefield Elimination Meet at Akron, Ohio.

In 1947, the *American Airlines Gas Model Cadets*—the junior division of the club—was formed for boys and girls 11 years old and younger. Members are picked from model classes conducted at Cleveland's Crafts and Art Center every Saturday morning under the supervision of older members of the American Airlines Gas Model Club.

There also is a Women's Auxiliary of the club, made up of the mothers, wives, sisters and friends of members. The Auxiliary assists at model meets, parties, banquets and other functions of the club. Mrs. Harry D. McCall is the present chairman.

Alan Vopal, who won the Berryloid Event for the best finished model at the National Meet held in Chicago in 1941, is the present president of the club. He and his brother, Jack, own the Merritt Finishing Company in Cleveland, which sponsors a team trophy each year at the Junior National Air Races. This trophy, awarded to the five-man team which accumulates the highest number of points during the meet, has been won by the American Airlines Gas Model Club in 1946, 1947, 1949 and 1950.

Oldest Club East of—etc. "Sorry to put a hole in their (the Long Island Gas Monkeys') gas tank, but the Bridgeport, Conn., Aeronuts have been darn active since 1936 and have never missed meeting at least every two weeks for all these years," pens Earl "Bud" Gay, publicity chairman for the 'Nuts.' "We are not a 'powerful' club but we have been very consistent in state and out-of-state contests. Our club is one of the few that has held state championships in control line stunt, speed and free flight. We have just added radio control and hope to be the first club in the New England states to have a radio meet sanctioned by A.M.A.

"I might also add that the *Hartford Aero Engineers* can lay claim to being active since before 1936. The *'Nuts* now have 33 members and are looking for more. We're proud of our original group which has scattered to the four winds. Lou 'National Stunt Champ' Andrews built and flew his first control line model as a member of our club."

Leading St. Looie Club. As many old-timers will recall, prewar St. Louis was very active in free flight and indoor and Stix, Baer & Fuller's Mississippi Valley meets were second only to the Nationals. During this "Brown Jr." period the Kirkwood, Mo., *Thermaleers* were organized by modelers from suburban Kirkwood, Glendale, and Webster Groves. The active membership stayed at about 25 until the war came along and tore up modeling by the roots. With the disbanding of the huge club sponsored for more than a decade by the Stix department store, the area was left with but a few small and scattered clubs, most of them exclusively control line.

The nucleus of old-timers from the *Thermaleers*, still active in rubber gas and indoor microfilm flying (and even with a few stunt models, on the sly, of course) decided to reorganize the club on a city-wide basis, open to all ages and categories of model builders. Biggest surprise was how the old

gang, now all family men and successful engineers, turned out almost to a man. Now, with members from all over the Greater St. Louis area, the *Thermaleers* have brought together all of the outstanding free flighters under one banner—the red and white sailplane. The year-round program of contests and activities continues to draw good turnouts at every bi-weekly meeting, regardless of the weather or season.

Last year the *Thermaleers* adopted a point system to determine its annual Junior and Senior-Open Champions. This competition was an unqualified success in that it served to greatly stimulate the building and flying of all types of models, and not merely those for which events were scheduled at local meets. The point system based on ideas brought back from Boston by George DeLaMater in brief gives credit for club records, flight times, speeds, and stunt points at contests, new members brought to meetings, new planes built and for attendance at regular meetings.

The way the point system had people broadening their interests to include vastly different types of models (stunt men building Wakefield, and C free flighters covering flimsy models with microfilm) and the way Sunday flying sessions went through regardless of wind and weather was a sight to make any old dope dauber's eyes light up. The *Thermaleers* heartily recommend something similar for every club, particularly for those which happen to be located where good contests aren't within reach every week end.

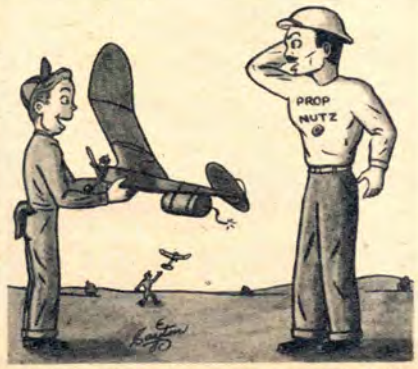
Details on the all-inclusive point system may be obtained from *Thermaleer* president Parnell Schoenky, 125 East Maple Ave., Kirkwood, Mo.

It's Rough in Rochester. "This letter," pens John F. Wolff of Rochester, N. Y., "is to let everyone know that the Rochester MAA is still alive and kicking. We have had some rough times in the past year but our club is still intact and we will welcome any new members. Meetings are held the 1st and 3rd Friday of each month at the Rochester Museum on East Ave.

"Last summer the City banned flying of model aircraft in the city parks. Of course we protested in a gentlemanly way and offered to help the city fathers in any way we could to provide a place for our hobby. Several letters were exchanged between our organization and City Hall along these lines. As a result all we got was a lot of political promises for an 'investigation' and 'an attempt to arrive at a satisfactory arrangement for all concerned.' So far as I have been able to find out there has been no investigation and certainly there has been no attempt made to arrive at the said 'conclusion.' The only thing we know is that you can't toss a Jim Walker glider into the air in any one of the city parks.

"It is really irritating that the newspaper releases on the subject gave the excuse for the ban as the danger involved—yet in the correspondence carried on later it was admitted by the city officials that the real reason was not the danger but the noise. Still the damage has been done and many parents are of the opinion that a model airplane is as dangerous as a case of dynamite. We would like to hear from other clubs or individuals with suggestions as to what we can do. It would be swell if anyone living in a city where facilities have been provided would write a letter directly to Mayor S. B. Dicker, City Hall, Rochester, N.Y. and explain their set-up to him.

"In spite of this bit of tough luck model airplanes seem to be weathering the storm. With the aid of a friendly farmer we were able to work with Half-A free flight and towline gliders during the winter. A local airport has let us have a corner of the field and we are trying to shape it up into a control line site. It's quite a project for a small club and we are having the usual financial difficulties. We are going to try very hard to complete this field this summer as it looks



"My new fuse dethermalizer never fails!"

like team racing is going to be a big thing around here. There are several under construction and several more 'on paper' at this time. It looks very interesting and I think it will be a real shot in the arm for the hobby, particularly from the spectator standpoint. We have a set of ground rules permitting only stock engines which really makes it a sport flyer's event. We also have an inter-club deal cooking with the Buffalo Flying Bisons—but more on that later."

Schoenky Speaking. Parnell Schoenky of Kirkwood, Mo., a mighty fine model designer - flyer - contestant - contest director, submits the following as a workable and fair formula for fitting Wakefield flying into the general contest picture. The floor is his: "There has been much talk of making the Wakefield our chief rubber event. Feeling that a mere substitution of Wakefield for outdoor cabin would be impractical and unfair, I have worked out the following realignment of rubber events; this proposed set-up preserves the plurality of events necessary to please many tastes and to fit all contest circumstances, and it is eminently fair in the light of four separate free flight gas events and four C-L speed events to have at least two major rubber events at every meet.

"1. Basic Rubber. Status: The general rubber event, allowing sufficient design leeway to keep it interesting and simple enough as to rules to make for rapid processing. (The thousands of rubber fans deserve a better break than the proposed chaotic 'unlimited' event could possibly provide.) Age classes: Senior and Open only, assuming the adoption of the Kitty Hawk type of simplified rubber for Junior flyers. Size classes: C and D to be flown together at small meets, and separately at larger contests; separate record listing. Class C, 90 to 180; D, 181 to 360; *or* C, 125 to 250; D, 251 to 400. Rules: Same wing loading, 4 oz. per 100 sq. in. For rapid processing, with no sacrifice in cross-sectional area control, use the rule—maximum perimeter of fuselage must be equal to or greater than one half of the fuselage length. Check with a piece of string, no scale or slide rules. Wheel diameter requirement retained. Only R.O.G. flights eligible for records, but HL flights permitted at meets if circumstances warrant.

"2. Wakefield Cabin. Status: The specialized event for advanced modelers and for the larger meets (where more experienced processing personnel are likely to be available). The Wakefield event is worthless without careful processing and strict adherence to flight rules, both of which require more work and experience than is available at the average small meet. Age classes: Strictly for the two upper age groups. There is no point whatever in opening an advanced event to youngsters who have their hands full with ordinary rubber models. Rules: S.M.A.E. rules for Wakefield competition.

"3. Kitty Hawk Rubber Event. Status: A simplified event would be a very good thing for Juniors because good rubber models are at least as hard to learn to build and fly as are good gas-powered models. With the uncomplicated models required under Kitty Hawk rules, the Juniors of 11 or 12 would have a fairer chance of success in competition with their 15 year old brothers. Age class: Junior. Rules: As set forth in Air Trails, with possible revisions in the light of further experience with the event. Again I emphasize that the event should be tailored to the abilities of the average 12-year-old, as younger children are *not* suited to contest flying and older Juniors should be held to fundamentally gadget-free models on a par flightwise with the 8th-graders.

"Note: The first set of wing-area size classes suggested for Basic Rubber was taken from a new over-all classification system worked out for outdoor models by old-timer Art Beskington; the system is as follows—Class A, 0 to 90 sq. in.; B, 91 to 180; C, 181 to 360; D, 361 and up. Hand launched gliders would include A&B; Rubber, B&C; towline gliders C&D, and free flight gas, BC&D."

And says Lo Salisbury of Huntington Park, Calif.: "You quote a 'well-known Eastern leader' to the effect that the Wakefield is 'out of date and uninteresting.' Kill it, switch to Half-A, etc., sez he. Isn't he being just a bit presumptuous? It is the British who have the say of whether it is killed or switched to Half-A. Now if he meant that the U. S. drop participation in the event—O.K. That would leave us with no international prestige. If he plans to originate an International event for Half-A—fine. I'll enter, but I doubt if any other nations besides U. S. would participate. You can't fly just any old type, you have to enter types there's an event for, right?"

Main point of contention as we see it, Lo, is that one group honors the Wakefield for its magnificent history, while the other feels that model progress has passed the big rubber jobs by and we should attempt to bring our International competitions "up to date," so to speak. TWT—time will tell.

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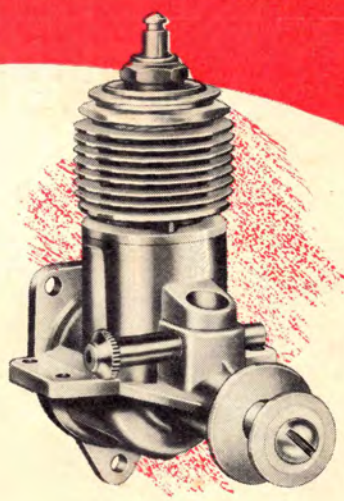

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